meta

the news digest magazine

Volume XXVII-No. 10 October, 1954

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WHY?

MORE FOR YOUR MONEY

PATENTS ISSUED—OTHERS PENDING:

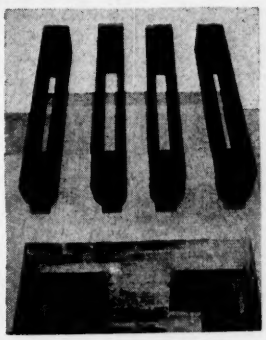
2,002,180 — 2,046,822 — 2,188,063 — 2,237,434 — 2,249,581 — 2,252,319 — 2,299,186 — 2,309,745 — 2,338,433 — 2,347,400 — 2,349,767 — 2,354,753 — 2,370,959 — 2,370,960 — 2,394,777 — 2,395,329 — 2,395,614 — 2,400,511 — 2,415,493 — 2,415,494 — 2,421,224 — 2,426,773 — 2,431,479 — 2,474,674 — 2,464,508 — 2,477,561 — 2,512,206 — 2,516,516 — 2,537,830 — 2,601,864.

SALES 80% PLUS:

As a matter of interest to you, a minimum of 80% of Holden products, whether applied to furnace or salt baths, are manufactured under patents issued or pending.

FOREIGN COUNTRIES:

In many of the foreign countries Holden products are covered by issued patents—this is more practically true of countries which are our allies—Canada, Great Britain, France, Italy, South Africa, Australia, Sweden, Brazil, and others.



Type 701-4 Submerged Electrode Unit with ceramic pot for neutral hardening and annealing 1000-2300°F.

Aluminum Heat Treating

Desanding—Descaling 18,000 lbs. per hr.—1800 KVA

More For Your Money Means Basically The Following:

1. Production of furnace equipment which has lower maintenance cost than any competitive type of salt bath equipment, regardless of the method of heating.

2. A minimum of down time regardless of type of heating, therefore, more production for the same dollar of original purchase.

3. In many cases, the designs as developed for electrical electrode furnaces have indicated 15 to 20% greater productive use or saving when these principles are applied to competitive furnaces.

(See Back Cover)

THE A. F. HOLDEN COMPANY

THREE F.O.B. POINTS—LOS ANGELES, DETROIT and NEW HAVEN

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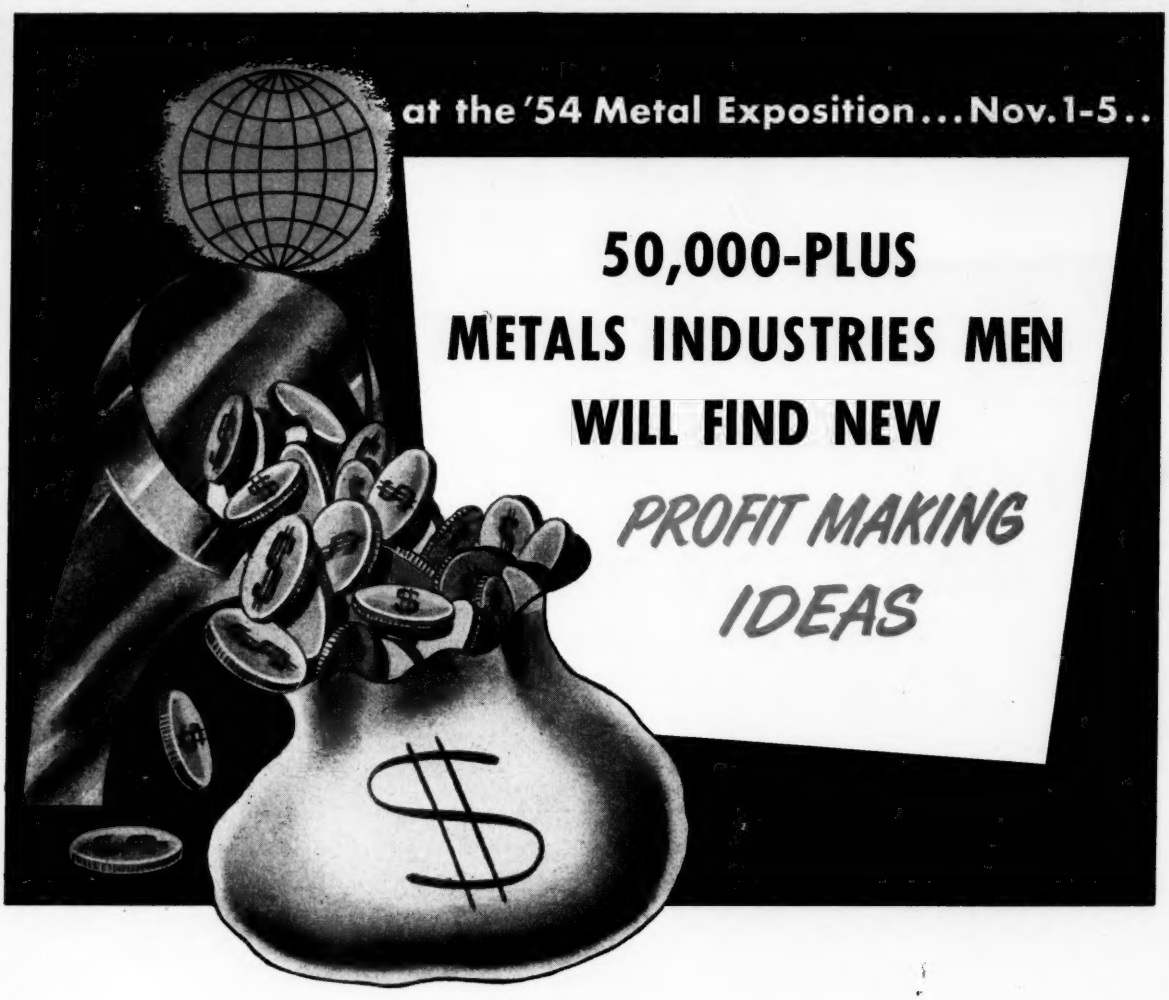

Searching for new product ideas . . . shooting for sharp competitive advantages, this great audience of metals industries men will be checking carefully into everything that's new . . . improved . . . outstanding in the metalworking field. What's more—they'll find what they're looking for—and they'll go away with more profit-making ideas than ever before! That's why today's tough competition demands your presence at the '54 Metal Show—its the one place where industrial profit-making ideas are born!

INTERNATIONAL AMPHITHEATRE
CHICAGO, ILL.
November 1 thru 5, 1954

NATIONAL METAL EXPOSITION

NATIONAL METAL CONGRESS

Owned and Managed by the

AMERICAN SOCIETY FOR METALS
7301 Euclid Avenue • Cleveland 3, Ohio

W. H. Eisenman,
Managing Director

Chester L. Wells,
Ass't. Director

Metals Review

VOLUME XXVIII, No. 10 October, 1954

THE NEWS DIGEST MAGAZINE

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National Metal Congress & Exposition

Chicago Nov. 1-5

ASM REVIEW OF METAL LITERATURE

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ASM to France—1955

One of the Best Known Sights on the Paris Scene, the Eiffel Tower

MEMBERS of the American Society for Metals who are planning to attend the European Metallurgical Meeting next June are looking forward eagerly to their visit to the country which is one of Europe's most important centers of iron, steel and aluminum production.

But, in addition to all its material advantages, France has the happy gift of being able to turn even the most schedule-bound business trip into a vacation. Her hotels, restaurants, theaters and transportation facilities have been geared for years to the needs of foreign visitors, and she has justly earned the title of the world's most gracious hostess.

The A.S.M. itinerary in France will cover Paris, Alsace-Lorraine, the Chateau Country, the Central Regions, Savoy, the Lille District, Caen in Normandy and St. Etienne in the Rhone Valley. Each of these places contains a wealth of tourist attractions as well as a natural significance to the metal industry.

City of Light

The old, well-known landmarks of Paris are well worth visiting, whether you are an old hand at traveling, or if this is your first trip away from the U.S.A. For night life, you will find the nightclubs and music halls as wonderful as you expected them to be. The theaters will surprise you with their low prices, and the museums are free or charge a very nominal entrance fee. Besides the Louvre, the world's largest art museum, the Petit Palais and other museums, you might like to see some of the lesser known but excellent industrial expositions, including the Museum of Arts and Professions, the Museum of Public Works, the Aeronautical Museum, and the Museum of the School of Mines.

The first of the tours outside of the city of Paris is to the city of Versailles, site of the historic palace which was the residence of the former kings of France, and the golden showplace of such monarchs as Louis XIV and Louis XV. It was also the scene of the signing of the peace treaty after World War I.

Seen Over the Roofs of the City Is the Strasbourg Cathedral

William the Conquerer and Joan of Arc

Caen, in Normandy, has played its part in history as well. It was the home of William the Conqueror and his wife, Mathilda, and there are many beautiful

Singers at a Folk Festival in Alsace Dressed in Their Native Attire

Well-Illuminated Fountains Before the Famous Palace at Versailles Present an Interesting Scene for Sightseers

churches built during their lifetime which still stand. The most impressive are the Abbaye-aux-Hommes, founded by William, and Mathilda's Abbaye-aux-Dames, where she lies buried. Caen stone was, and still is, considered so beautiful that much of it was transported into England for construction in that country.

Nowadays Caen is a quiet town with wide streets and shady boulevards, connected by a canal to the sea. It is well known for its iron mines, worked since Roman times, and as a horse breeding and agricultural center.

In eastern France, bordering on Germany, are the provinces of Alsace and Lorraine, unique self-possessed areas which have maintained a distinct individuality in spite of outside influences.

In this area is Domremy where Joan of Arc was born, the "Little Venice" of Colmar, the vineyards of Ribeauville from which are produced the pale aromatic wines like Rieslings and Sylvaners, and the Chateau du Haut-Koenigsbourg, crowning one of the loftiest peaks of the Vosges Mountains. Here too is a gourmet's paradise. Pate-de-foie gras, cheddar and munster cheese and quiche Lorraine, a spicy meat tart, are some of the region's most heralded specialties.

The famous Strasbourg music festival is held each year in June, and a special journey has been planned to Metz, where the cathedral which contains some of the earliest known stained glass ever made stands.

Linen to Take Home

While visiting the iron and steel works near Lille, the visitor will have a good opportunity to buy linen goods to take home at a great savings over prices in the U.S.A. Lille is a town noted for flax spinning and weaving of table linen and damask. It is also the site of the Cathedral of Notre Dame de la Treille, scene of many important pilgrimages.

Issoire in central France, and St. Etienne, an industrial town in the east central part of the country, offer equally beautiful textiles. For those interested in architecture, the Church of St. Paul or St. Austremoine in Issoire, a wonderful example of Auvergne Romanesque, are well worth a visit.

Highest Mountain in Europe

The tour will next take the visitor through Savoy, one of France's mountainous regions and home of the highest mountain in Europe, Mont Blanc. The mountain roads are interesting examples of engineering ingenuity. Near Monthon is the chateau built on the site where St. Bernard was born over 1000 years ago, and the road passes by Chinon, the starting point of Joan of Arc's journey to restore the rightful king to the throne of France. Savoy is world famous for the cheeses native to the region—Roblochon, Beaufort, Beaumont and Tanier, or the goat's milk cheeses called chevrotin and chevrette.

Passing through the Chateau Country in the Loire and Indre valleys, the road winds past the castle of Blois, built in the 15th century by Francois I, Chambord, the largest chateau in France, and Loches, remembered for its capture by Richard the Lion Hearted in the short space of three hours.

France Welcomes Americans

Frenchmen are most eager to welcome American visitors, and some of the visitors' most memorable experiences will come from contact with the people themselves. The National Board of French Trade Unions, 31 avenue Pierre-Ier-de-Serbie, Paris, and the French Government Tourist Office with branches in the United States will be glad to give the A.S.M. to Europe member additional information on how to follow up his own particular business or sightseeing interest in France.

This article was specially prepared for Metals Review by the French Government Tourist Office in New York.

Montmartre Crowns the Section of Paris Interspersed With Narrow Cobblestoned Streets and Interesting Little Shops

Arc de Triomphe, Under Which Have Passed Armies of the World

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Serene Still Stands The Abbaye-aux-Dames At Caen in Normandy

Youth Looks at Science—

Twice a Winner of the A.S.M.-Sponsored National Science Achievement Award, Charles Yulish, Miami Beach, Describes His Experiments in the Use of Radioactive Phosphorus in the Study of Plant Nutrition

I have been asked to give a capsule report on how and why I became interested in atomic energy. To do this, I must give a resume of the factors which motivated me up until three years ago. Until that time I had been a highly mischevious boy, I had mediocre grades in school and was always a major contributor to any pranks or plots which developed, in school and out. As could be expected, my education consisted of a low-calorie diet of comic books and the usual 25c thrillers.

At that time, I became unsatisfied with myself almost as much as my parents were, and began to look for something which would occupy my mind and satisfy my tremendous ego. I had noticed in comic books a trend to the "destroy the world with an atomic bomb" type of writing and became aware of the fact that the only news about atomic energy was that of the atomic bomb. It occurred to me that maybe I could find something of a different nature on the subject so I wrote to the Atomic Energy Commission in Washington and asked for information on atomic energy and its constructive uses. Within a few weeks I received several booklets and reprints on radioisotopes and their applications in the fields of medicine, agriculture and industry.

I also got books from the library and, as I began to understand the terminology, my interest in the subject really jumped. I wrote again to A.E.C. and asked for further information, and, as I read more and more on atomic energy, I began to realize the vastness of the program in which America is involved.

Until mid-1952, I had done nothing about my interest but read up on the subject and write a few papers, and I wondered if I could do any work in this field.

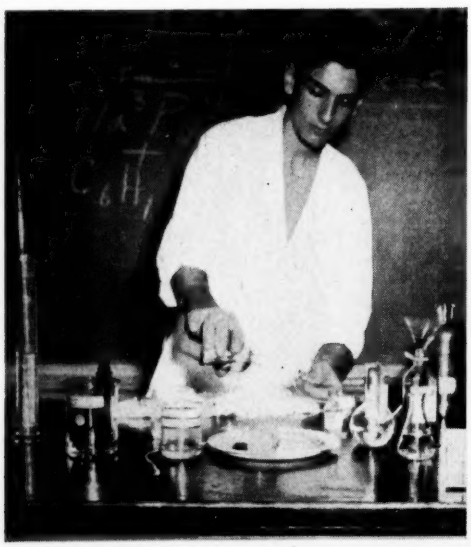
That year I started biology, my first contact with science as a beneficial asset to mankind. While groping my way around the world of paramecium and bryophites, I began to take pride in my mastering of scientific terms. I remember the day my teacher, Miss Birdie McAllister, talked to the class about plant nutrition and metabolism. When she said a plant's diet consisted mainly of such minerals as phosphorus, manganese, calcium, etc., I raised the question, "How do you know the plant uses all these minerals?"

She asked me to come see her after school and she offered me several books on plant nutrition, and, as we sat and talked, I realized she wanted to help me with my work. Something she said reminded me of an article I had seen in one of the A.E.C. books, and when I got home, I found the article, which was concerned with the use of radioactive phosphate as a fertilizer additive to study plant nutrition. I again wrote to A.E.C. asking if it would be possible for me to use a small quantity of radiophosphorus to experiment with the isotope in relation to plant nutrition.

By return mail, I received a letter from Dr. Brydon of the Isotopes Division at Oak Ridge, explaining the use of P-32 (the isotope of phosphorus) in plant nutrition and giving me information on its handling. He also sent booklets detailing the experiments being done with P-32.

The next summer I went up to Cleveland to help my father in his store. While there I stopped in at the Victoreen Instrument Co. and spoke to the sales manager, Ben McIntire. I told him about the experiments I had in mind and told him how I had been using a junior Geiger counter for my work, and that if I were to do the experiments properly, I would need a good Geiger counter, one like the Thyac which Victoreen makes for the government. I asked if the company would loan me one for the duration of my experiments. Although it sounds as though I had a nerve to make such a request, I got the counter on a 45-day loan and now, almost a year later, I still have the counter and Victoreen has repaired it twice for me without charge.

In the fall, with Miss McAllister's help, I was allowed the use of the anteroom adjacent to the biology lab in the Miami Beach Senior High School. I started corresponding with many companies asking for donations of instruments and materials, and was so successful that I almost completely equipped a little laboratory with the donations I received. By the end of the first month in school, the laboratory had already used one shipment of radiophosphorus and I had an application in for larger amounts. I was given special permission to make larger purchases and, slowly, but surely, I made forward progress and my efforts began to pay off. I



Right: Charles Yulish, High-School Student, Experimenting With Radioactive Phosphorus. Below: The Geiger Counter and Other Equipment Used by Charles in His Laboratory

Part of the Materials Received With the Atomic Energy Commission's Permission Are Shown in Charles' High-School Atomic Laboratory

had been feeding plant leaflets small amounts of P-32 and watching for any changes in structure or growth. By using a process similar to the x-ray process, I was able to illustrate concentration of phosphorus in any part of the leaf by a glance at the pictures I made.

Mr. Katz, the principal of the school, had the school board put shelves in the lab, and with the donation of a large amount of concrete blocks, I set up shields to cope with the amount of activity I was now using. I received additional authorization from A.E.C. to use 500 microcuries of P-32, 50 times the exempt amount, 100 microcuries of Sulphur-35, and 10 microcuries of Calcium-45.

I had an opportunity to give several demonstrations to interested students after school and the response was always good. However, there was the problem of an instrument to use in demonstrations and in physics and chemistry classes. Such a demonstration-type Geiger counter costs about $150 and to date I have not been able to talk the school board into giving one to the lab. I have put about $250 of my own money into the lab for materials I could not get donated, but I do not regret spending one cent of it.

Some people have argued that I am doing this for selfish reasons. In defense, I would like to outline the proposed plans of study the laboratory will offer this fall. A copy of this program was presented to the A.E.C. and has been approved. An Atomic Energy Club will be formed, to consist of about 25 members. I will teach the fundamentals of atomic energy and its application in the various sciences. A group of selected boys will begin training after school on radioisotope techniques and applications, which means that after I graduate, the lab will continue to function and will not be dependent upon me for its existence.

We will offer movies on atomic energy and its peacetime applications in science and medicine, and will give demonstrations in assembly to acquaint the student body and teachers with the fundamentals of radiation and radioisotopes. We will supplement the biology, physics and chemistry classes with live demonstrations on related phases of nuclear studies. This is not just what we hope to do, the plans have been drawn up and are approved.

The A.E.C. honored me by inviting me to Oak Ridge for a two-week visit. I was taken through the reactor and shown how radioisotopes are made, processed and shipped. I visited Abbott Laboratories and found that Mr. Gleason, the manager, had been following my work with interest. The thing that amazed me most was that the biggest men were the most interested. No effort was spared to make my visit a profitable one, educationally wise. Miss McAllister was honored by being accepted for the Oak Ridge Institute of Nuclear Studies course on Radioisotope Use in Secondary Schools.

It was a great joy to me to win the Future Scientists of America contest, sponsored by the American Society for Metals, twice in a row. I admit that I thought my chances were slim, but my first win gave me the push I needed. I saw that some people did show an interest in my work and could see its possibilities on a high-school level.

The title of my first entry was "Atomic Energy, Blessing or Curse?" I think that it is time the high-school student be looked on as worthy of as much knowledge as he can get on this vital subject. The A.E.C. is willing to do its part, but, in essence, it is up to the teachers to awaken the students to the necessity of meeting this challenge head on, and to the students to carry on with what they have learned.

With more Miss McAllisters' to awaken the teenagers' interests, and more Dr. Brydens' to nurse them along, there wouldn't be any trouble getting scientists for the future. With more programs such as the Future Scientists of America to give students the incentive and push they need, an intelligent and resourceful generation will take over the reins and keep them pulled to the right way of life. This applies to all fields, and cannot be restricted to science alone.

I have given our laboratory the name RELPAR, which is short for Radioisotopes Experimental Laboratory for Plant and Animal Research. If anyone would like to correspond with me, you may write to the following address.

Charles Yulish, Student Director
RELPAR Laboratory
Miami Beach Senior High School
1420 Drexel Ave.
Miami Beach, Fla.

Announces Plans for Ninth Western Metal Exposition in L. A.

For the ninth time in the last 25 years, the Western Metal Exposition is being prepared by the American Society for Metals on a more extensive scale than ever before.

The long-established show will be given Mar. 28 through Apr. 1, 1955 in the Pan-Pacific Auditorium, Los Angeles, the largest exposition structure west of Chicago.

In addition to the huge auditorium, two specially placed pavilions will be erected to house hundreds of displays by the country's leading firms which produce for or service the west's industrial plants.

A.S.M. Secretary William H. Eisenman, has announced that the demand for exhibit space has necessitated using 150,000 sq. ft. of display area. All will be on the same floor level.

On dates of the show, the Ninth Western Metal Congress will take place in Los Angeles' Ambassador Hotel. Technical programs, roundtables and question-answer periods will be conducted by technical societies devoted to the production, treating, machining and fabrication of metals.

Nineteen prominent technical societies besides A.S.M. are co-sponsoring the Exposition and Congress. Those belonging to these societies will be registered and admitted to the show on display of membership cards.

Attendance far in excess of 50,000 is predicted. Clocked attendance at the Western Metal Exposition of 1953, also held in Pan-Pacific Auditorium, totaled 53,453.

Los Angeles merits the combined Exposition and Congress for the recent rapid expansion of the metal industry in the west and southwest. Invariably in the past the show and technical sessions have acted as a two-way team in introducing new developments to lower costs and increase production. The two events will be packed with profit-making ideas, brand new information, extensive production know-how and liberal quotas of helpful advice for heads of industry.

The show will repeat many of the displays from the National Metal Exposition being held in Chicago Nov. 1-5, 1955.

The Metallurgical Advisory Board has designated as the medium through which information relative to metallurgical problems may be transmitted to the profession.

American Society for Metals

Technical Program
National Metal Congress
Chicago, Oct. 30-Nov. 5, 1954

(All Technical Sessions To Be Held at the Palmer House)

Monday, Nov. 1

9:30 a. m.—Ballroom

CONSTITUTIONAL DIAGRAMS

PRESIDING: B. W. Gonser
Battelle Memorial Institute
and J. E. Burke
General Electric Co.

Aluminum-Vanadium Alloy System, by O. N. Carlson, D. J. Kenney and H. A. Wilhelm, Iowa State College.

Partial Phase Diagram of the Iron-Cerium System, by James O. Jepson and Pol Duwez, California Institute of Technology.

Titanium-Cobalt System, by F. L. Orrell, Jr., Dow Chemical Co., and M. G. Fontana, Ohio State Univ.

System Titanium-Aluminum-Manganese, by R. F. Domagala and W. Rostoker, Armour Research Foundation.

Constitution of Ordering Alloys of the System Copper-Gold, by F. N. Rhines, W. E. Bond and R. A. Rummel, Carnegie Institute of Technology.

2:00 p. m.—Ballroom

MECHANICAL METALLURGY

PRESIDING: R. B. Johnson
General Electric Co.
and W. T. Lankford
United States Steel Corp.

Effect of Prestraining Under Different Stress States on the Fracture and Flow Properties of 2S-0 Aluminum, by I. Rozalsky, Shell Oil Co.

Deformation Mechanisms in Polycrystalline Aggregates of Magnesium, by F. E. Hauser, C. D. Starr, L. S. Tietz and J. E. Dorn, University of California.

Tensile and Impact Properties of Low-Carbon Martensites, by C. C. Bu by and H. W. Paxton, Carnegie Institute of Technology, and M. F. Hawkes, U. S. Naval Ammunition Depot, Hawaii.

Tensile Characteristics of Unalloyed Zirconium at Low and Moderate Temperatures, by J. H. Keeler, General Electric Co.

2:00 p. m.—Red Lacquer Room

PROCESSING

PRESIDING: W. M. Baldwin
Case Institute of Technology
and L. P. Tarasov
Norton Co.

Influence of Chemical Composition on the Machinability of Rephosphorized Openhearth Screw Steel, by E. J. Paliwoda, Jones & Laughlin Steel Corp.

Influence of the Grinding Process on the Structure of Hardened Steel, by W. E. Littmann, Timken Roller Bearing Co., and John Wulff, Massachusetts Institute of Technology.

Zonal Rolling Texture of Low Carbon Steel Cold Rolled at Various Temperatures, by C. Nu baum, Case Institute of Technology, and W. Brenner, Cold Metal Products Co.

Tuesday, Nov. 2

9:30 a. m.—Ballroom

HARDENABILITY

PRESIDING: R. D. Chapman
Chrysler Corp.
and F. T. McGuire
Deere & Co.

An Electron Metallographic Study of the Dependence of Microstructure on Hardenability, by S. T. Ross, R. P. Sernka and W. E. Jominy, Chrysler Corp.

Calculation of Hardenability in High Carbon Alloy Steels, by C. F. Jatczak and R. W. Devine, Jr., Timken Roller Bearing Co.

Hardenability of Carbon Toolsteel, by N. J. Culp, Carpenter Steel Co.

Effect of Carbon and Nitrogen on the Attainable Hardness of Martensitic Steels, by A. E. Nehrenberg, P. Payson and P. Lillys, Crucible Steel Co. of America.

INDUSTRIAL HEATING
PANEL SESSION I

Presented by the Industrial Heating Equipment Association Under the Auspices of ASM

9:30 a. m.—Red Lacquer Room

ATMOSPHERES

Theory of Gases, by Allen G. Hotchkiss, General Electric Co.

Exothermic Atmosphere, by W. H. Boyd, Gas Atmospheres, Inc.

Endothermic Atmosphere, by Ralph J. Perrine, Electric Furnace Co.

Dry Nitrogen-Base Prepared Atmospheres, by Donald Beggs, Surface Combustion Corp.

Dissociated Ammonia, by M. R. Ogle, Drever Co.

Atmospheres, Their Control and Safety, by W. L. Besselman, Leeds & Northrup Co.

2:00 p. m.—Ballroom

PHYSICAL METALLURGY

PRESIDING: M. J. Day
Armour Research Foundation
and V. H. Patterson
Climax Molybdenum Co.

Conditions for Dendritic Growth in Alloys, by W. Morris, W. A. Tiller, J. W. Rutter and W. C. Winegard, University of Toronto.

Stress-Corrosion Mechanism in a Magnesium-Base Alloy, by D. K. Priest, Pfaudler Co., and F. H. Beck and M. G. Fontana, Ohio State University.

Thermodynamics of Binary Interstitial Solid Solutions, by R. Speiser and J. W. Spretnak, Ohio State University.

Influence of Substructure on the Shape of the Creep Curve, by T. Hazlett and R. D. Hansen, University of California.

SEMINAR ON IMPURITIES AND IMPERFECTIONS

(All Meetings in Ballroom, Palmer House)

Saturday, Oct. 30

9:30 a. m.

Lattice Vacancies and Interstitials, by Harvey Brooks, Harvard University.

Dislocations, by J. C. Fisher, General Electric Co.

Grain Boundaries, Substructure and Impurities, by R. W. Cahn, University of Birmingham, England (Visiting Lecturer, Johns Hopkins University).

2:00 p. m.

Effects on Crystal Growth, by Bruce Chalmers, Harvard University.

Effects and Imperfections in Metallic Diffusion, by David Lazarus, University of Illinois.

Role of Structural Impurities on Phase Transformations, by David Turnbull, Ceneral Electric Co.

Sunday, Oct. 31

9:30 a. m.

Effects on Mechanical Properties, by E. R. Parker, University of California.

Effects on Electrical Properties, by J. S. Koehler, University of Illinois.

Effects on Chemical Properties, by W. D. Robertson, Yale University.

2:00 p. m.

Impurity Phenomena in Semiconductors, by J. A. Burton, Bell Telephone Laboratory.

Effects on Dielectrics and Ionic Crystals, by R. J. Maurer, University of Illinois.

Radiation Damage, by Frederick Seitz, University of Illinois.

INDUSTRIAL HEATING
PANEL SESSION II

2:00 p. m.—International Amphitheatre

ATMOSPHERE APPLICATIONS

Carburizing, by Walter Holcroft, Holcroft & Co.

Equilibrium Relationships for Dew Point Measurement and Control, by N. K. Koebel, Lindberg Engineering Co.

Practical Applications of Dew Point Measuring and Control, by O. E. Cullen, Surface Combustion Corp.

Brazing, a movie by LeRoy B. Thompson.

Carbonitriding, by Harold Ipsen, Ipsen Industries.

Neutral Heat Treating, by A. W. Frank, Hevi Duty Electric Co.

Sintering, by Carl G. Paulson, C. I. Hayes, Inc.

Wednesday, Nov. 3

9:00 a. m.—Ballroom

ASM ANNUAL MEETING
CAMPBELL MEMORIAL LECTURE

Factors Affecting Directional Properties in Aluminum Wrought Products, by Kent R. Van Horn, Aluminum Co. of America.

2:00 p. m.—Ballroom

MECHANICAL PROPERTIES

PRESIDING: A. L. Geisler
General Electric Co.
and M. F. Judkins
Firth Sterling, Inc.

Elastic Limit and Yield Behavior of Hardened Steels, by H. Muir, Otago University, Dunedin, New Zealand, and B. L. Averbach and Morris Cohen, M.I.T.

Effect of Composition on Transverse Properties of Slack-Quenched Steel, by J. Vajda and P. E. Busby, Carnegie Institute of Technology.

Statistical Fatigue Properties of Lamellar and Spheroidal Eutectoid Steel, by G. E. Dieter, Ordnance Corps, and R. F. Mehl and G. T. Horne, Carnegie Institute of Technology.

Effect of Static Stress on the Damping of Some Engineering Alloys, by A. W. Cochardt, Westinghouse Electric Corp.

2:00 p. m.—Red Lacquer Room

FERROUS PHYSICAL METALLURGY

PRESIDING: J. A. Berger
University of Pittsburgh
and R. A. Grange
United States Steel Corp.

Further Study of Microstructural Changes on Tempering Iron-Carbon Alloys, by B. S. Lement, B. L. Averbach and Morris Cohen, M.I.T.

Effects of Cold Work on Cementite in Steel, by D. V. Wilson, Birmingham University, England.

Isothermal Transformation of Austenite Under Externally Applied Tensile Stress, by S. Bhattacharyya and G. L. Kehl, Columbia University.

INDUSTRIAL HEATING
PANEL SESSION III

2:00 p. m.—International Amphitheatre

INDUCTION HEAT

Induction Melting, by G. W. Holz, Lindberg Engineering Co.

Induction Brazing, by E. S. Goodridge, Induction Heating Corp.

Induction Heat Treating, by H. B. Osborn, Jr., Ohio Crankshaft Co.

Sixty-Cycle Induction Heating for Forming and Extrusion, by John A. Logan, Magnethermic Corp.

High-Frequency Induction Heating for Hot Forging, by Frank T. Chesnut, Ajax Electrothermic Corp.

Dual-Frequency Heating for Hot Forging, by Carl P. Bernhardt, Westinghouse Electric Corp.

Thursday, Nov. 4

9:30 a. m.—Ballroom

STAINLESS

PRESIDING: D. J. Carney
United States Steel Corp.
and Peter Payson
Crucible Steel Co. of America

Effect of Cold Work and Recrystallization on the Formation of the Sigma Phase in Highly Stable Austenitic Stainless Steels, by A. J. Lena and W. E. Curry, Allegheny Ludlum Steel Corp.

Laves and Chi Phases in a Modified 12Cr Stainless Alloy, by F. L. VerSnyder and H. J. Beattie, Jr., General Electric Co.

Austenitic Chromium-Manganese-Nickel Steels Containing Nitrogen, by R. Franks, W. O. Binder and J. Thompson, Electro Metallurgical Co.

Effect of Deformation on the Martensitic Transformation in Austenitic Stainless Steels, by H. C. Fiedler, General Electric Co., and B. L. Averbach and M. Cohen, M.I.T.

9:30 a. m.—Red Lacquer Room

HEAT TREATMENT

PRESIDING: G. V. Smith
United States Steel Corp.
and J. W. Spretnak
Ohio State University

Role of Water Vapor and Ammonia in Case Hardening Atmospheres, by P. A. Clarkin and M. B. Bever, M.I.T.

Effect of Heat Treatment Upon Microstructures, Microconstituents and Hardness of a Wrought Cobalt-Base Alloy, by J. W. Weeton and R. A. Signorelli, Lewis Flight Propulsion Laboratory, N.A.C.A.

Secondary Graphitization of Quenched and Tempered Ductile Cast Iron, by J. C. Danko and J. F. Libsch, Lehigh University.

Method for Determining the Continuous Cooling Transformations in Steel, by R. D. Chapman and W. E. Jominy, Chrysler Corp.

2:00 p. m.—Red Lacquer Room

HIGH TEMPERATURE

PRESIDING: W. O. Binder
Electro Metallurgical Co.
and W. D. Manley
Oak Ridge National Laboratory

Elevated Temperature Properties of Ductile Cast Iron, by C. R. Wilks, N. A. Matthews and R. Wayne Kraft, Jr., American Brake Shoe.

Effect of Cold Work on the High-Temperature Creep Properties of Dilute Aluminum Alloys, by R. E. Frenkel, Oleg D. Sherby and John E. Dorn, University of California.

Creep-Tempering Relationships in Hardened 4.5% Chromium Steels, by E. C. Roberts, Montana School of Mines, and N. J. Grant and Morris Cohen, M.I.T.

Strength of Wrought Zirconium-Base Binary Alloys at 1800 to 2200° F., by H. A. Saller, J. T. Stacy and S. W. Porembka, Battelle Memorial Institute.

Lecture Course on Temperature Measurement

(All Meetings in Room 14, Palmer House)

Monday, Nov. 1

4:30 p. m.

Industrial Temperature Measurement With Thermocouple Pyrometers, by W. E. Belcher, Jr., Minneapolis-Honeywell Regulator Co., Brown Instruments Div.

Tuesday, Nov. 2

4:30 p. m.

Industrial Temperature Measurement With Total Radiation and Optical Pyrometers, by Donald Robertson, Leeds and Northrup Co.

Wednesday, Nov. 3

4:30 p. m.

Industrial Temperature Measurement With Resistance Thermometers and Filled Systems, by W. F. Hickes, Foxboro Co.

Laboratory Instruction in Process Metallurgy*

Monday, Nov. 1

9:30 a. m.—Palmer House

Development of Laboratory Experiments for the Unit Process Approach to Extractive Metallurgy, by R. Schuhmann, Jr., Purdue University.

Role of Metallurgical and Thermodynamic Problems in the Metallurgical Engineering Laboratory, by C. S. Samis, University of British Columbia.

Unit Process Experiments in Fluid Flow, Combustion and Heat Transfer for Metallurgical Engineering Students, by W. O. Philbrook, Carnegie Institute of Technology.

Special Problems for Experiments in Process Metallurgy Laboratory, by A. W. Schlechten, Missouri School of Mines.

Role of Electrochemical Experiments in Process Metallurgy Instruction, by Herbert H. Kellogg, Columbia University.

**Conducted by A.S.M. Advisory Committee on Metallurgical Education.*

Give Stainless Facts at Jacksonville

K. A. Matticks and J. A. Goodford, Crucible Steel Co. of America, Discussed "Manufacturing, Forming and Welding of Stainless Steel" at a Meeting in Jacksonville. Shown are, from left: Walter S. Morris, chairman, Mr. Goodford, H. J. Huester, program chairman, and Mr. Matticks

Speakers: K. A. Matticks and J. A. Goodford

Crucible Steel Co. of America

K. A. Matticks, service engineer, and J. A. Goodford, chief welding engineer, Crucible Steel Co. of America, spoke before the **Jacksonville Chapter** on the "Manufacturing, Forming and Welding of Stainless Steel". The meeting was held in the plant of the Bushnell Steel Co., one of Jacksonville's leading industrial companies.

Mr. Matticks emphasized the fact that steel must contain at least 11.5% chromium to be classified as stainless, but it may also contain other alloying elements. There are more than 50 grades of stainless steel recognized by the American Iron and Steel Institute. All stainless steel can be classified into three groups: Straight chromium steels, containing from 11.5 to 18% chromium; straight chromium steels of higher chromium content; and chromium-nickel steels.

Mr. Matticks provided technical data sheets on the various stainless steels and answered numerous questions during the course of his talk. Questions relative to welding were referred to Mr. Goodford, who gave a talk on the weldability of stainless steel.

Bushnell Steel Co. was host to the group of 110 members who attended. **—Reported by Russell R. Robinson for Jacksonville.**

Tri-City Opens Season With Tool and Die Talk

Speaker: J. Y. Riedel

Bethlehem Steel Co.

The **Tri-City Chapter** heard J. Y. Riedel, toolsteel engineer, Bethlehem Steel Co., speak on "Improving Production From Tools and Dies", at its first technical meeting of the season.

Mr. Riedel's talk covered the prerequisites necessary for the user to get full value out of a given tool: Good tool design; sound toolsteel of the correct grade; proper heat treatment; good grinding practice; and proper handling and use of the tools in service.

Mr. Riedel stated that the best grinding practice is not to grind at all, since it is impossible not to stress a part when grinding. A lively discussion period resulted from this statement, and many problems concerning the grinding of finished tools were cleared up.

Concerning the carburizing of tool parts to produce extreme wear resistance, Mr. Riedel stated that a low-carbon, 0.010-in. thick case would be a good average one to apply.

In discussing the proper handling and use of the tools in service, Mr. Riedel explained an easy method for determining whether a blank tool was operating with great clearance. He stated that if a blank tool is operating properly, the sheared or bright portion of the cut should be uniform all around the piece and comprise about 40% of the total thickness. The balance of the thickness would be rough and have a torn appearance. — **Reported by Paul Scherbner for Tri-City Chapter.**

New Films

Genii of the Flame

Surface Combustion Corp. has produced a 16-mm. Kodachrome sound firm entitled "Genii of the Flame" which describes the applications of gas in industrial processing and its use in homes. It covers the steel, transportation, glass, food and many other industries. The film is available upon request to Surface Combustion Corp. Advertising Department, Toledo 1, Ohio.

Die Casting

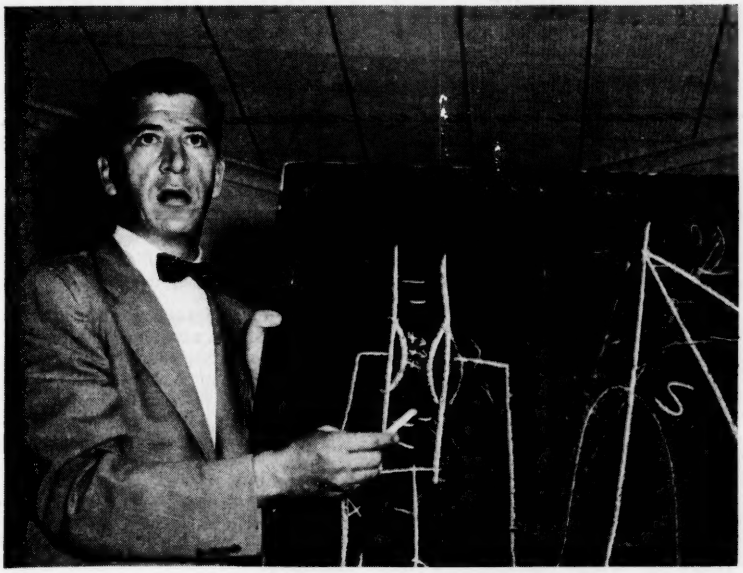
A 16-mm. sound and color motion picture entitled "Die Casting, How Else Would You Make It?" has been produced by the American Zinc Institute. The film portrays the design, production and application of die casting of all metals.

Further information may be obtained by writing to: American Zinc Institute, 60 East 42nd St., New York 17.

Carolinas Present 1954-55 Officers

Present at the Installation of New Officers of the Carolinas Chapter for the Coming Season Were, Seated, From Left: H. R. Tillman, Director; J. R. Huntley, Chairman; A. R. Fairchild, First Past-Chairman of the Chapter; J. J. Hairston, Director. Standing, from left: E. R. Talone, director; W. J. Cason, director; H. F. Blackwood, Jr., vice-chairman; and R. J. Polivka, secretary. (Reported by J. J. Hairston for the Carolinas)

Talk on Semiconductor Opens Season



Ben H. Alexander, Engineering Manager, Sylvania Electric Products Inc., Demonstrates a Point Brought Out in His Talk on "Semiconductors" Given Before the First Meeting of the Northeast Pennslyvania Chapter This Year

Speaker: Ben H. Alexander

Sylvania Electric Products Inc.

Ben H. Alexander, engineering manager of the Electronics Division, Sylvania Electric Products Inc., opened the **Northeast Pennsylvania Chapter's** technical year with a talk on "Semiconductors".

Dr. Alexander stated that semiconductors are presently receiving a lot of attention in regards to transistors and have been ever since the Bell Telephone Laboratories announced their invention in 1948. The transistor, he explained, is a solid state device that can perform most of the functions of a vacuum tube with the advantage of being smaller and more rugged. At present, the semiconductors, germanium and silicon, are most widely used in this application.

Germanium and silicon have very open crystal lattices with the bonding between atoms being made by covalent electrons that are not free to move. The result is low electrical conductivity. With an increase in temperature, these covalent electrons are energized to move about, and conductivity increases.

The following characteristics are used to distinguish semiconductors:

A. Intrinsic conductivity—a measure of the binding energy which increases with temperature or other energizing means.

B. Extrinsic conductivity is controlled by the measured addition of other elements, called doping, to the semiconductor, such as germanium. If the impurity adds electrons to the lattice of germanium, it is called a donor impurity and forms *n*-type germanium. Antimony is one such impurity. If the impurity, such as gallium, has a deficiency of electrons, it is an acceptor impurity and forms *p*-type germanium.

C. Mobility—the ability of the electrons to move about.

D. Lifetime or diffusion length—indicates the distance an electron can travel before combining with a lattice "hole". Lattice defects and surface imperfections decrease the lifetime of a semiconductor by fostering the combination of "holes" and electrons. For this reason transistors are constructed of single crystals of nearly perfect structure.

In outlining the manufacture of single crystals, Dr. Alexander stated that germanium is purified by fractional crystallization to the point where impurities are reduced to about one part per billion. To the purified germanium, the desirable impurity is then added by the same process in the amount of 10 to 100 parts per billion, and nearly perfect single crystals are grown. These crystals are then carefully reduced in size. Contact areas on the germanium tablets are made with indium, which is melted and allowed to fuse to the surface of the tablet.

Dr. Alexander stated that the elimination of crystal defects is one of the biggest problems in semiconductors and is yet to be solved.—**Reported by A. J. Babecki for Northeast Pennsylvania.**

G is sponsor through the National Science Teacher Association of awards for junior and senior high school science teachers and Recognition Awards for schools.

Tatnall Speaks in Buffalo

Speaker: Frank G. Tatnall

Baldwin-Lima-Hamilton Corp.

The **Buffalo Chapter** heard Frank G. Tatnall, manager, testing research division, Baldwin - Lima - Hamilton Corp., speak on "Testing—Up to Date and Simplified", at its first meeting of the year. Mr. Tatnall called upon his over 30 years of experience in the testing field to deliver a very instructive talk on the history, developments and future potentials in the testing field.—**Reported by A. E. Leach for the Buffalo Chapter.**

Vacuum Metallurgy Meeting

A Symposium on Vacuum Metallurgy will be held as a part of the 106th annual meeting of the Electrochemical Society in Boston in October. Sponsored by the Electrothermics and Metallurgy Division of the Society, the Symposium will feature papers by well-known authors on vacuum melting, vacuum heat treating and the properties of the metals and alloys thus produced.

IMPORTANT MEETINGS
for November

Nov. 3-5—Steel Founders' Society of America. Annual Technical and Operating Conference. Carter Hotel, Cleveland. (F. Kermit Donaldson Executive Vice-President S.F.S., 920 Midland Bldg., Cleveland 15).

Nov. 3-5—Twelfth Annual Pittsburgh Diffraction Conference. Mellon Institute, Pittsburgh, Pa. Joint meeting with the American Crystallographic Association. (P. K. Koh, Allegheny Ludlum Research Laboratories, Brackenridge, Pa.)

Nov. 8-11—Wire Association. Annual Convention. Statler Hotel, Detroit. (R. E. Brown, Secretary, W. A., 453 Main St., Stamford, Conn.)

Nov. 11-12—Gray Iron Founders' Society. 26th Annual Meeting. Homestead, Hot Springs, Va. (C. O. Burgess, Technical Director, G.I.F.S., 210 National City-East 6th Bldg., Cleveland 14, Ohio).

Nov. 18-19—American Society for Quality Control. Ninth Midwest Quality Control Conference. Baker Hotel, Dallas, Texas. (K. A. Lifson, 6621 Del Norte Lane, Dallas 25).

Nov. 18-19—National Association of Corrosion Engineers. Fourth Annual Western Regional Conference. Los Angeles, Calif. (A. B. Campbell, Executive Secretary, N.A.C.E., 1061 M & M Bldg., Houston 2, Texas).

Nov. 28-Dec. 3—American Society of Mechanical Engineers. Annual Meeting. Hotel Statler, New York City. (Ernest Hartford, Executive Assistant Secretary, A.S.M.E., 29 West 39th St., New York 18, N. Y.)

Nov. 29-Dec. 2—International Automation Exposition. 244 Regiment Armory, New York. (First International Automation Exposition, 845 Ridge Ave., Pittsburgh 12, Pa.)

Metallurgical News and Developments

Devoted to News in the Metals Field of Special Interest to Students and Others

A Department of *Metals Review*, published by the
American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio

Foxboro Plant—The Foxboro Co., Foxboro, Mass., has announced the opening of its modern facilities for industrial instruments assembly, service and repair in Pittsburgh, Pa.

AEC Expansion—AEC is considering a $40-million expansion of its uranium-producing facilities in the St. Louis area.

Forging Plant—Alcoa will build a $4-million forging plant to press out wing parts, fuselages and engines of supersonic jet fighters and bombers at its Vernon Works in Los Angeles.

Working Aluminum — Consolidated Iron-Steel Manufacturing Co. has announced that it can now take a 3-in. thick plate of aluminum, fabricate it and weld it, meaning that plate aluminum can replace weaker cast aluminum in many applications.

Texas Chemicals—More than 60-million lb. of chemicals a year will be produced at the new Texas plant of Carbide & Carbon Chemical Co., for use in such products as low-temperature lubricants and greases, coating resins and oil additives.

Corrosion Conference—The University of Tennessee will hold a 4-day Corrosion Conference from Mar. 1-4, 1955, in cooperation with the National Association of Corrosion Engineers.

Ceramic Coating—A new coating developed by Armour Research Foundation protects metal from both extreme heat and chemical attack. The coating is not brittle and can be applied to almost any clean surface at a few hundred degrees Fahrenheit.

Radioactive Tracers—A tiny radioactive tracer is being used by the Aluminum Co. of America to evaluate lubricants, alloy development, metal flow during the extrusion process.

Metal Detector — Loma Electronic Equipment Ltd., showed a new type electronic detector called the "Metalector" at the British Industries Fair. The detector not only warns of the presence of stray pieces of metal in, for example, foodstuffs, but it will stop the conveyor and drop a marker on the production belt.

Aluminum Piston—A steel-belted aluminum piston has been developed by Thompson Products, Cleveland, for automotive and small aircraft use. The piston has great strength, good heat dissipation, simple design and almost perfect control of thermal expansion.

Aluminum Wheels—Budd Co. has added a forged aluminum disk wheel made by Aluminum Co. of America to its line of steel truck wheels. The light-weight wheel permits increased payload capacity on large trailer trucks without sacrificing wheel strength.

Titanium Production—Titanium sponge production in 1953 was 2241 short tons, over double the production of 1952, but far less than defense requirements. At the end of the year, Titanium Metals Corp. of America was producing titanium sponge under a government contract calling for 18,000 short tons over a 5-year period.

Ontario Ore Deposits—Jones & Laughlin plans tests and study of a large iron ore deposit in a tract of land six miles from Kirkland Lake, Ontario. The company's geologists say the ore deposit is a magnetic taconite. Tonnages and grades are not known but may contain as much as 150 million tons of crude open-pit magnetic taconite ore.

Copper and Brass Research—The copper and brass mill industry, with the cooperation of leading copper mining companies, has started an increased research and promotion program, according to reports from the 32nd Annual Meeting of the Copper & Brass Research Association recently held. Primary purpose of this program will be to develop through research maximum utilization of copper in many new modern applications.

TO A.S.M. Members: Many of you are looking forward with pleasure to more details about the Technical Societies Congress in Europe from June 1-19, 1955. If you wish to be immediately informed on additional plans as they develop for the technical program and the planned visits, then send your name to A.S.M. headquarters and request to be placed on the mailing list to receive information about "A.S.M. to Europe in '55".

New Motor Generator Station—A motor generator control and heating station incorporating many new features has been designed by Lindberg Engineering Co., for forging, hardening, brazing or annealing operations where deep penetration of heating is desired.

Plant Moves — Scovill Manufacturing Co., Los Angeles, has moved into bigger quarters to provide additional space for warehouse stocks for the Los Angeles and Pacific Coast areas.

More Domestic Manganese—Manganese Chemicals Corp. has completed a new leaching system at their Riverton, Minn., plant. Manganese Chemicals is the first company to successfully extract highly pure manganese from low-grade ores on the Cuyuna Range of Northern Minnesota.

New Jet Alloys—Vacuum melted, high-temperature special alloys for turbine wheel buckets of jet engines and other applications, headed by a new alloy capable of withstanding higher temperatures than any wrought alloy now in production, are being produced by the Carboloy Dept., General Electric Co.

Pacific Furnaces—Furnaces and heat treating equipment of the Pacific Scientific Co., Los Angeles, will now be manufactured in Cleveland for eastern markets. The line includes carburizers, hardening, shaker hearth and other furnaces, and a complete line of generator equipment.

Engineering Course—The University of California is offering its first engineering and management course, to run from Jan. 31 through Feb. 11, 1955. The course will offer training in elementary concepts of management and motion-study and advanced concepts of linear programming and electronic data processing. For further information write: E. P. Coleman, coordinator, Engineering and Management Course, College of Engineering, University of California, Los Angeles 24, Calif.

Changes Name — Edgcomb Steel Corp., distributors of steels and aluminum, has announced that the company will now be called Edgcomb Steel & Aluminum Corp., a move which recognizes the growth in their sales of aluminum since this material was added to their line in 1947.

CHAPTER MEETING CALENDAR

CHAPTER	DATE	PLACE	SPEAKER	SUBJECT
Akron	Nov. 17	Mayflower Hotel	F. W. Boulger	Metallurgical Aspects of Machinability
Calumet	Nov. 9	Phil Smidt's Restaurant	Tom Perry	Forming and Uses of Titanium
Canton-Massillon	Nov. 9	Mergus Restaurant	A. G. Cook	Hot Extrusion of Stainless Steels
Carolinas	Nov. 8	Greensboro	F. R. Kappel	Joint Meeting—ASTE
Cedar Rapids	Nov. 9	Hotel Roosevelt	B. A. Rogers	New Metals
Cincinnati	Nov. 11		A. J. Langhammer	Recent Developments in Powder Metallurgy
Cleveland	Nov. 8	Hotel Hollenden	J. H. Friedman	Engineer's Responsibility on the Management Team
Dayton	Nov. 10	Engineers' Club	E. F. Lundeen	Cold Forming of Mild Steel Sheets
Detroit	Nov. 8	Engineering Society	C. G. Schelly	Civilization Through Tools
Jacksonville	Nov. 8			Atomic Energy
Kansas City	Nov. 17	Milleman's	R. J. Perrine	Heat Treat Atmospheres
Los Angeles	Nov. 18	Rodger Young Auditorium	J. W. Freeman	Super Alloys
Louisville	Nov. 2	5 and 1 Club	E. J. Krabacher	Machining and Grinding of Titanium
Mahoning Valley	Nov. 9	V.F.W.	J. C. McDonald	Manufacture and Fabrication of Magnesium Sheet and Extrusions
Manitoba	Nov. 18	Marlborough Hotel	K. Skeie	
Milwaukee	Nov. 16	City Club	Harry Neifer	Relation of Metallurgy to Design
Minnesota	Nov. 18	Normandy Hotel	T. W. Lippert	Titanium—Fabrication and Properties
Muncie	Nov. 9	New Castle	A. E. Nehrenberg	The TTT Curve—A Guide to Heat Treatment
New Haven	Nov. 18	Colony Inn, Seymour	Geo. Schaefer and Robert Stokes	Modern Rolling Mill and Extrusion Press Equipment
New Jersey	Nov. 15	Essex House	K. B. Baker	Aluminum Alloy Fabrication and Heat Treatment
New Orleans	Nov. 3	New Orleans City Club	E. C. Miller	Metals and Atomic Power
New York	Nov. 15	Schwartz's Restaurant	G. A. Roberts	New Developments in High Speed Steels
Northwestern Pennsylvania	Nov. 18	Titusville	Milton Leven	Stress Analysis
Notre Dame	Nov. 10	Engineering Bldg.	W. J. Harris, Jr.	Notch Toughness of Alloy Steels
Oak Ridge	Nov. 17	S & W, Knoxville	Earl Gulbransen	Classical Theory of Diffusion and Oxidation of Metals
Ontario	Nov. 12	Royal York, Toronto	R. J. Law	Corrosion in Action
	Nov. 19	Royal Connaught, Hamilton	G. DeYoung	Pioneering in Specialty Steel Mill Development
Ottawa Valley	Nov. 2	P.M.R.L.	J. H. Moore	Vacuum Metals
Philadelphia	Nov. 26	Engineers Club	George Roberts	Toolsteels
Philadelphia Jr. Section	Nov. 8	Engineers Club	Fred Schultz	Quality Control
Purdue	Nov. 16	Purdue Memorial Union	J. Strauss	Hot Extrusion of Steel
Rhode Island	Nov. 3	Johnson's	Warren Eberly	Applications of High-Nickel Alloys in the Electronic Field
Rochester	Nov. 8	Howard Johnsons	Frank L. Whitney	Factors in Selection of Corrosion Materials
Rocky Mt. Denver	Nov. 19	Oxford Hotel	E. C. Bain	Research Development of the Steel Industry—Past and Present
Rome	Nov. 8	Utica, N. Y.	Plant Visit	Utica Drop Forge and Tool Co.
Saginaw Valley	Nov. 9	Frankenmuth Hotel	John H. Freye, Jr.	Metallurgical Problems in Nuclear Reactors
Savannah River	Nov. 11	Alpine Restaurant	F. M. Rhines	Remelting Aluminum
St. Louis	Nov. 19	DeSoto Hotel	G. A. Roberts	Powdered Metallurgy of Alloyed Steels
Toledo	Nov. 11	Maumee River Yacht Club	D. E. Walcutt	Trends in Modern Forging
Tri-City	Nov. 2	Rock Island Arsenal	O. W. McMullen	Metallurgical Factors Affecting Machinability
Tulsa	Nov.	Michaelis Cafeteria	F. A. Prange	Design for Corrosive Service
Western Ontario	Nov. 12	Mario's Tavern	W. A. McIntyre	Extrusion of Steel
Worcester	Nov. 10	Marlboro Country Club	T. C. Dumond	General Trends in Heat Treating
York	Nov. 10	Harrisburg	F. G. Tatnall	

A. S. M. Review of Current Metal Literature

An Annotated Survey of Engineering, Scientific and Industrial Journals and Books Here and Abroad Received During the Past Month

Prepared by the Technical Information Division of Battelle Memorial Institute, Columbus, Ohio

A General Metallurgical

218-A. Operating Experiences With Gas-Turbine Plants in the Steel Industry. I. H. Pfenninger. *Blast Furnace and Steel Plant,* v. 42, Aug. 1954, p. 942 + 4 pages.

Fuels, applications and performance of Brown-Boveri turbines. Diagrams, tables, graphs. (To be continued.) (A5, ST)

219-A. Systems for the Destruction of Cyanide Wastes at Buick Motor Division. R. J. Brink. *Industrial Waste Conference, Proceedings, Purdue University,* Eighth, 1954, p. 72-85.

Equipment and operating procedures. Diagrams, tables. (A8)

220-A. Methods for Treating Metal Finishing Wastes. Hubert S. Kline. *Industrial Waste Conference, Proceedings, Purdue University,* Eighth, 1954, p. 96-104.

Treatment of cyanide and chromic acid wastes. Neutralization and chemical precipitation. (A8)

221-A. Plating Waste Treatment. C. F. Paulson. *Industrial Waste Conference, Proceedings,* Eighth, 1954, p. 215-221.

Treatment of electroplating rinse waters by ion exchange. Diagram, table. (A8, L17)

222-A. AEC Urges Uranium Recovery From Waste Phosphate Sources. *Pit and Quarry,* v. 47, Aug. 1954, p. 83, 86, 98.

Description of recovery units. Flowsheets, photographs. (A8, U)

223-A. Do You Want Production or Profit? Nyles V. Reinfeld. *Tooling and Production,* v. 20, Aug. 1954, p. 44-48, 69.

Application of linear programming can increase company profits in addition to studying a wide range of management problems. Tables, diagrams. (A4)

224-A. (German.) **Silicosis in Foundries in Area of Velbert, Heiligenhaus and Neviges.** Walter Reinl, Wolfgang Greinert and Werner Rascher. *Staub,* 1954, no. 36, p. 213-227.

Incidence and types of silicosis in various kinds of foundries according to age groups, specific jobs and sex. Tables, graph. 27 ref. (A7, E general)

225-A. Profitable Use of Exhaust Fume. R. J. Ruff. *Industrial Heating,* v. 21, Aug. 1954, p. 1583 + 8 pages.

Use of catalytic combustion, application to core ovens and drying installations. Graphs, diagrams, photograph. (A8)

226-A. Planned Maintenance in a Steelworks. I. How Planning Is Organized. A. G. Thomson. *Iron & Steel,* v. 27, Aug. 1954, p. 423-424.

System designed to prevent and reduce occurrence of breakdowns and minimize their severity by regular inspection and attention to plant. (To be continued.) (A5, D general)

227-A. Custom-Engineered Wire Items Mass-Produced by Fabricator. Howard E. Jackson. *Western Metals,* v. 12, Aug. 1954, p. 60-62.

Seattle wire products fabricator tailors each job for the customer, yet has engineered production on mass basis. Photographs. (A5, F28, G general)

228-A. The Importance of the Steel Industry. Ernest T. Weir. *American Iron and Steel Institute, Preprint,* 1954, 12 p.

Economic analysis. Table. (A4)

229-A. Discharging Iron Ore From Ship to Wagon. *Engineering,* v. 178, Aug. 13, 1954, p. 207-211.

Improved unloading and handling plant capable of 1,250,000 tons annually. Photographs, diagrams. (A5, Fe)

230-A. Controlling Uranium Dust. H. I. Miller, Jr. *Heating, Piping & Air Conditioning,* v. 26, Sept. 1954, p. 109-113.

Design of exhaust system. Diagrams. 4 ref. (A8, U)

231-A. Scrap Report—Tests Emphasize Scrap Quality Control. Incinerator Scrap and No. 2 Bundles Related to Adverse Heat Time. George G. Mueller. *Journal of Metals,* v. 6, Sept. 1954, p. 952-953.

Bundled scrap gave higher sulfur, copper and tin residuals than regular scrap. Tables. (A8, D2, ST)

232-A. Scrap Report—Ingot Yield Rises as Market Permits Greater Care in Scrap Selection. A. K. Moore. *Journal of Metals,* v. 6, Sept. 1954, p. 953.

Effects of scrap quality on melting speed and amount of residuals. Tables. (A8, D2, ST)

233-A. The Safety Factor in the Design of Seamless Steel Gas Cylinders. S. E. Mitchell. *Metallurgia,* v. 50, no. 298, Aug. 1954, p. 87-89.

Factors to be considered. Comparison of practices in various countries. Graph, table. (A7, SS)

The coding symbols at the end of the abstracts refer to the ASM-SLA Metallurgical Literature Classification. For details write to the American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.

234-A. Adequate Strategic Metal Supply in Event of Future National Emergency Assured by Gov't. John D. Morgan, Jr. *Metals (Daily Metal Reporter Monthly Supplement),* v. 25, Aug. 1954, p. 7-8.

Factors leading to increasing stocks. (A4, B10)

235-A. A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging,* v. 21, Aug. 1954, p. 369-375.

From "needlestone" to "nilo". Diagrams, tables. (To be continued.) (A10)

236-A. (French.) **Physics and Ferrous Metallurgy.** Paul Bastien. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 273 + 5 pages.

Role of physics in the production of metals and metallurgical research. (A general, U1, ST)

237-A. (French.) **The Nonferrous Metals Market.** J. Bertin-Roulleau. *Metallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 341-343.

World trends in production and consumption. (A4, Cu, Pb, Sn, Zn)

238-A. (Book.) **Glossary of Terms Relating to Iron and Steel. British Standard 2094. I. General Metallurgical, Heat Treatment and Testing Terms. II. Steelmaking. III. Hot Rolled Steel Products (Excluding Sheet, Strip and Tubes). IV. Steel Sheet and Strip. V. Bright Steel Bar and Steel Wire. VI. Forgings and Drop Forgings, 1954.** British Standards Institution, British Standards House, 2 Park St., London, W.1, England. Pt. I, 6/-. Other parts 2/6d each.

Prepared at the request of the Iron and Steel Industries Committee with the purpose of helping to establish a uniform application of terms in current use. (A10, Fe, ST)

239-A. (Book.) **Metals Technology.** Alfred Borneman, editor. 109 p. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. $3.00.

Fundamentals of metals and their behavior. Detailed laboratory exercises and experiments for 24 operations, plus a classification of metals, alloys, and micrographs. (A general)

240-A. (Book.) **Nuclear Engineering.** F. J. Van Antwerpen, editor. Pt. I. 280 p. 1954. American Institute of Chemical Engineers, 120 East 41st St., New York 17, N. Y.

Papers from the meeting on nuclear engineering sponsored by the American Institute of Chemical Engineers and the University of Michigan at Ann Arbor on June 20 to 25, 1954. Includes discussions of beryllium, uranium and thorium metallurgy; heat transfer; operating experience with graphite-moderated piles; and description of various reactors. (A general)

241-A. (Book.) **Rare Metals Handbook.** Clifford A. Hampel, editor. 657

p. 1954. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. $12.00.

Comprehensive survey of available data on 34 rare or uncommon metals. (A, EG-b)

242-A. (Book.) **The Story of Shotts.** Augustus Muir. 80 p. 1954. The Shotts Iron Company, Ltd., Edinburgh, Scotland.

Historical sketch (A2, A5)

B

Raw Materials and Ore Preparation

249-B. Anaconda's Nevada Project—New Approach to Copper Mining. R. H. Ramsey. *Engineering and Mining Journal,* v. 155, Aug. 1954, p. 74-92.

Equipment and operation of copper leaching plant. Photographs, tables, diagrams. (B14, Cu)

250-B. New Mexico Uranium. John B. Huttl. *Engineering and Mining Journal,* v. 155, Aug. 1954, p. 96-99.

Equipment and procedures for beneficiation of uranium ores. Photographs, diagrams. (B14, U)

251-B. New Plant Successfully Floats Michigan Jasper. Robert Cochran. *Engineering and Mining Journal,* v. 155, Aug. 1954, p. 100-104, 114.

Plant for beneficiation of taconite. Photographs, diagrams, table. (B14, Fe)

252-B. Roasting Metallic Sulphides in a Fluid Column. H. M. Cyr, C. W. Siller and T. F. Steele. *Journal of Metals,* v. 6, Aug. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 900-904.

Development of a new metallurgical roasting device. Diagrams, photograph, table. 6 ref. (B15)

253-B. Beneficiation of Low Grade Cassiterite Ore From Ranchi, Bihar. G. V. Subramanya and P. I. A. Narayanan. *Journal of Scientific & Industrial Research,* v. 13, sec. B, June 1954, p. 441-444.

About 75% recovery by jigging and tabling enables simple ore dressing methods to produce a marketable grade suitable for smelting. Tables. 7 ref. (B14, Sn)

254-B. Closed-Circuit or Open-Circuit Grinding? II. H. Börner. *Pit and Quarry,* v. 47, Aug. 1954, p. 117-120, 123-125. (Translated from *Zement-Kalk-Gips,* 1952, Aug.)

Grinding diagrams, feed rates, surface and particle size studies, grinding work. Graphs, tables. 17 ref. (B13)

255-B. Mining & Beneficiating Low Grade Iron Ores at J&L's New York Division. R. G. Fleck. *Skillings' Mining Review,* v. 43, Aug. 14, 1954, p. 1-2, 20-23.

Iron ore mining, crushing and concentration. Photographs, flowsheets. (B12, B13, B14, Fe)

256-B. Mill Users Favor Quality Refractories. Robert M. Love. *Steel,* v. 135, Aug. 16, 1954, p. 107, 110.

Advantages and trends in use of basic brick and castables. Photographs. (B19)

257-B. (English.) **On the Dissociation Pressure of Pyrite.** Tominmatu Isihara and Kingo Sudo. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 5, no. 6, Dec. 1953, p. 561-572.

Experimental and theoretical determination of roasting mechanism of pyritic ores. Tables, graphs, diagram. 32 ref. (B15, Cu)

258-B. (English.) **On the Imperfection of Magnetite From Kamaishi Mine, Iwate Prefecture, Japan.** Tsunehiko Takeuchi and Matsuo Nambu. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 1, Feb. 1954, p. 83-88.

Chemical, X-ray, magnetic and thermal test data on two grades of ores. Tables, graph, X-ray patterns. (B10, Fe)

259-B. (German.) **The Grinding Functions and the Kinetics of Crushing Processes.** G. F. Hüttig and F. Moser. *Planseeberichte für Pulvermetallurgie,* v. 2, no. 1, June 1954, p. 15-19.

Review of literature covers put-through characteristic, frequency of grain-size distribution, rate of grinding and rate of change of grain-size distribution. Table, micrographs. 11 ref. (B13)

260-B. (German.) **Method of Producing Slag Sand.** Paul Grossstück. *Stahl und Eisen,* v. 74, no. 16, July 29, 1954, p. 1011-1015.

Methods of granulation of blast furnace slag, properties resulting from different methods of granulation. Tables, graphs, diagrams. 3 ref. (B21, A8)

261-B. Cyanamid Reagents. *American Cyanamid Company, Mineral Dressing Notes no.* 20, Apr. 1954, 43 p.

Properties and uses of cyanamid chemicals in mineral processing, particularly those used in the froth flotation process. Tables. (B14)

262-B. Beneficiation of Ferruginous Manganese Ore. V. S. Gaitonde. *Indian Institute of Science, Journal,* v. 36, sec. A, July 1954, p. 170-181.

Results of magnetic separation, froth flotation and chlorination methods. Tables. 10 ref. (B14, Mn, Fe)

263-B. Sinter for Open Hearth Charge. E. G. Hill. *Industrial Heating,* v. 21, Aug. 1954, p. 1556 + 5 pages.

Production and use of sinter mixes. Sintering machine. Tables. (B16, D2, Fe)

264-B. A Practical Determination of Residence Time and Short Circuiting of Dry Solids or Solids in Slurries in Continuous Systems. R. B. Coleman and J. D. Moore. *Mines Magazine,* v. 44, Aug. 1954, p. 35-38.

Determination of maximum capacity of continuous ore beneficiation systems. Diagrams, graphs. (B14)

265-B. (German.) **The Flotation Plant Marevce/Novo Brdo in the Kosmet.** Werner Gründer. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 7, July 1954, p. 283-289.

Processes and difficulties in flotation of lead-zinc ores. Results of numerous large-scale experiments performed in 1953. Photographs, diagram, graph, map, tables. 6 ref. (B14, Pb, Zn)

266-B. (German.) **Spain's Tungsten Deposits.** Friedrich Ahlfeld. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 7, July 1954, p. 290-295.

Geological positions and conditions, mineral contents, mining and concentration practices. Map. 1 ref. (B10, B14, W)

267-B. Some Engineering Features in Modern Ore Dressing and Smelting Practice. C. C. Downie. *South African Mining and Engineering Journal,* v. 65, pt. 1, July 31, 1954, p. 841, 843.

Dimensions and capacities of crushers, motors and briquetting equipment. 8 ref. (B13, B17, C21)

268-B. (German.) **Plant Results in the Beneficiation of Iron Ores by the Flotation Process. A. Heavy Liquid Beneficiation of the Wet Process of the Colbrecht Ore Mine Salzgitter Aktiengesellschaft.** Arnold Goltz. **B. Previous Results From the Flotation Process of Beneficiating the Salzgitter Ores of the Morgenstern Mine.** Wolfgang Jacobs. **C. The Flotation Process of Beneficiating Siderite in the "Alte Hütte" Plant at Wissen.** Otmar Burghardt. *Stahl und Eisen,* v. 74, no. 17, Aug. 12, 1954, p. 1070-1075.

Procedures. Flow charts, graph, tables. (B14, Fe)

C

Nonferrous Extraction and Refining

178-C. Induction Melting of Metals. Normal and High Frequency Equipment Surveyed. *Metallurgia,* v. 50, no. 297, July 1954, p. 25-28.

Latest developments. Photographs. (C21, D6)

179-C. The Extractive Metallurgy of Uranium. R. D. Macdonald. Paper from "Nuclear Engineering. Pt. I.". American Institute of Chemical Engineers, p. 69-74.

Ore concentration, leaching procedures and recovery of uranium from both acid and alkaline solutions. Tables. 14 ref. (C general, B14, U)

180-C. (French.) **Concept of Density of Thermal Losses and Its Importance in the Behavior of Aluminum Baths.** L. Ferrand. *Journal du Four Electrique,* v. 63, no. 3, May-June 1954, p. 71-74.

Equations for calculating heat loss during electrolytic refining of aluminum. Graph. 3 ref. (C23, Al)

181-C. A Bottom-Pour, Arc-Type Furnace for Melting and Casting of Titanium. O. W. Simmons, H. R. McCurdy and R. E. Edelman. *American Foundrymen's Society, Preprint no.* 54-36, 1954, 5 p.

Design and operation. Photographs, diagrams. 7 ref. (C21, Ti)

182-C. The Effect of Nickel and Hydrogen Overvoltage on the Precipitation of Gold. H. A. Hancock and G. Thomas. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 508, Aug. 1954, p. 539-546; disc., p. 546-548; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 337-346.

Tests of gold precipitation in the presence of fouling agents. Diagrams, graphs, tables, photograph. 12 ref. (C23, Au)

183-C. Zirconium Production. G. L. Miller. *Metal Industry,* v. 85, Aug. 6, 1954, p. 103-105.

Recent developments in commercial production, Kroll process for zirconium sponge, reduction process separating hafnium and melting. Photographs, graph, diagram. 4 ref. (C26, C28, Zr)

184-C. Aluminothermal Production of Aluminum-Titanium Alloys. J. Cueilleron and C. Pascaud. *Henry Brutcher, Altadena, Calif., Translation no.* 3018, 5 p. (From *Comptes rendus,* (Paris), v. 223, Oct. 1, 1951, p. 745-747.)

Previously abstracted from original. See item 9-C, 1952. (C26, Al, Ti)

185-C. (French.) **Phenomenon of Isotopic Separation Incited by Passage of Electric Current in the Molten**

Metal. Guy Nief and Etienne Roth. *Comptes rendus,* v. 239, no. 2, July 12, 1954, p. 162-164.

A current of 1.5 to 2.5 amp. caused appreciable isotopic separation in 99.9% pure gallium. Graph. 1 ref. (C28, Ga)

186-C. (French.) **Metal Working and Semiproducts.** J. R. Tschudnowsky. *Revue de l'Aluminium,* v. 31, no. 211, June 1954, p. 181-191.

Processes and equipment for continuous casting, melting, hot drawing, rolling, wire drawing, forging, welding and extrusion. Photographs. (C5, E10, F general, K general, Al)

187-C. (German.) **Separation of the Platinum Metals With the Aid of Highly Basic Anion Exchangers.** E. Blasius and U. Wachtel. *Zeitschrift für analytische Chemie,* v. 142, no. 5, 1954, p. 341-356.

Isolation and separation of ruthenium, rhodium, palladium, iridium and platinum. Purification of platinum from iron, copper and nickel. Diagrams, tables. 28 ref. (C28, Ru, Rh, Pd, Ir, Pt)

188-C. Midvale Smelter Practice Modified for Two Shift Operation. Hugo L. Johnson and Casper A. Nelson. *Journal of Metals,* v. 6, Sept. 1954, p. 949-951.

Changes in equipment and practices in lead plant. Photographs, table. 2 ref. (C21, Pb)

189-C. Mathematical Methods for Zone-Melting Processes. Howard Reiss. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1053-1059.

Mathematical analysis of solute redistribution as molten zones pass. Graphs, table. 11 ref. (C5)

190-C. (German.) **The Metallurgical Possibilities of the Induction Furnace in Comparison With Other Types of Furnaces.** Willi Goedecke. *Giesserei,* v. 41, no. 16, Aug. 5, 1954, p. 405-410.

Design and operation so as to benefit from stirring action of electromagnetic forces. Graphs, diagrams, table. (C21, D6)

D

Ferrous Reduction and Refining

349-D. Wheeling Steel Corporation's Steubenville Works. Charles Longenecker and Harry E. Trout. *Blast Furnace and Steel Plant,* v. 42, Aug. 1954, p. 901-927.

Plants and equipment, including blast furnaces, openhearth furnaces, blooming mills, hot strip mills, galvanizing plants, coke plant, Bessemer converters, etc. Photographs, diagrams, tables. (D general, F general, A5, ST)

350-D. Blast Furnace Design Problems. II. Fred E. Kling. *Blast Furnace and Steel Plant,* v. 42, Aug. 1954, p. 934-937.

Ways to improve life and operation of stoves, hot blast mains, mixers and ladles. Diagrams. (D1, Fe)

351-D. Survey Provides Analysis of Cold Metal Shop Melting Practice. S. L. Fredericks. *Journal of Metals,* v. 6, Aug. 1954, p. 880-882.

Significance of data obtained on the charging and fluxing practices in cold metal shops. Photographs, tables. (D2, ST)

352-D. Ingot Cracks in Killed, Fine-Grained C1020 Steel. M. A. Orehoski, N. R. Arant and J. A. Pusateri. *Journal of Metals,* v. 6, Aug. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 891-899.

Conditions responsible for cracks during top-pouring practice and corrective measures. Photographs, tables, diagram. 7 ref. (D9, CN)

353-D. Oxygen in Steelmaking. *Metallurgia,* v. 50, no. 297, July 1954, p. 10-12.

Desiliconizing of hot metal; oxygen lancing in the openhearth; use in converter process. Photograph. (D2, D3, ST)

354-D. Methane for Openhearth Fuel. D. W. Gillings. *Metal Progress,* v. 66, Aug. 1954, p. 91-93.

Use of direct combustion and in combination with fuel oil. Substitution for coke oven gas. Use for underfiring coke ovens. Diagrams. (D2, B18)

355-D. Furnace Men Report on Advantages of Induction Stirrer. (Digest of papers presented at the Electric Furnace Steel Conference of the American Institute of Mining and Metallurgical Engineers, Cincinnati, Ohio, Dec. 2 to 4, 1953.) *Metal Progress,* v. 66, Aug. 1954, p. 140, 142-143.

History and operating characteristics of stirrer. (D6)

356-D. The Future of Steelmaking. Possible Development of Counterflow Continuous Process as Substitute for the Open-Hearth. M. W. Thring. *South African Mining and Engineering Journal,* v. 65, pt. 1, July 10, 1954, p. 725, 727, 729, 731.

Review of fuel consumption in openhearth furnaces and recent improvements in furnace efficiency. Characteristics and advantages of continuous furnaces. Tables, graphs. 4 ref. (D2)

357-D. (French.) **Considerations on the Charging of Large Blast Furnaces Designed for Crushed Ore. Star-Shaped Distributing Throat.** M. H. Meynadier. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 8, 1954, p. 1515-1526.

System of charging in which gas can leave the throat without having to pass through the ore falling from the lower bell. Diagrams. (D1, C1)

358-D. (French) **Changes of Slag and Metal Compositions During Pouring.** M. Achard. *Centre de Documentation Sidérurgique, Circulaire d'Informations Techniques,* v. 11, no. 8, 1954, p. 1527-1535.

Development and extent of variations in 58 heats of soft and semi-soft chromium-nickel steel. Tables, charts. (D9, AY)

359-D. (French.) **Induction Stirring of Arc-Furnace Bath.** *Journal du Four Electrique,* v. 63, no. 3, May-June 1954, p. 82-83.

Effective for low carbon steels; effects during refining and deslagging; increase of desulfuration and deoxidation speed. (D6, D5, CN)

360-D. (German.) **Exchange of Experiences at the Ministry for the Heavy Industry, Chief Administration of the Iron Industry. Ingot-Surface Defects and Their Causes.** S. Kronmarck. *Metallurgie und Giessereitechnik,* v. 4, no. 6, June 1954, p. 243-250.

Causes, effects and methods of avoiding cracks, nonmetallic inclusions, slag and oxide entrapment, and surface blow holes. Graphs, photographs, tables. 11 ref. (D9, ST)

361-D. (German.) **On the Problem of Reducing Nitrogen Pickup in the Basic Steel Converter.** Reinhold Baake, Hans Eisenreich and Kurt Schröder. *Metallurgie und Giessereitechnik,* v. 4, no. 6, June 1954, p. 253-254.

Experimental data reveal effects of melting time, air-blast pressure, depth of bath, original temperature of charge, casting temperature and age of converter on the nitrogen content of the steel. Graphs. (D3, CN)

362-D. The Electric Smelting of Iron Ore. W. M. Armstrong. *Canadian Mining and Metallurgical Bulletin,* v. 47, no. 508, Aug. 1954, p. 517-522; *Canadian Institute of Mining and Metallurgy, Transactions,* v. 57, 1954, p. 315-320.

Design and operation of electric smelters for pig iron production. Diagrams, tables. 14 ref. (D5, CI-a)

363-D. The Chemical Basis of the Manufacture of Iron and Steel. D. J. O. Brandt. *Chemistry & Industry,* 1954, no. 32, Aug. 7, p. 982-987.

Reduction of iron ore, removal of impurities, and blast furnace and openhearth reactions. Diagrams, graphs. 2 ref. (D1, D2, Fe)

364-D. Lackenby Open Hearth Steel Works. I. *Engineer,* v. 198, Aug. 6, 1954, p. 190-193 + 2 plates.

Development of post-war program of a British company. Diagrams, photographs. (To be continued.) (D2, ST)

365-D. Gasholders. Special Applications in the Steel Industry. T. H. Riley. *Iron & Steel,* v. 27, Aug. 1954, p. 399-402.

Principles, uses and advantages of water-sealed, waterless, dry-sealed and fabric-sealed holders. Photographs, diagram. (D general)

366-D. Pig Beds. A Method of Machine Moulding. G. S. Milburn. *Iron & Steel,* v. 27, Aug. 1954, p. 409-410.

Handling iron surplus with minimum labor and maximum speed. Photographs, diagram. (D9)

367-D. Simplified Control Curbs Arc Furnace Power Appetites. *Steel,* v. 135, Aug. 23, 1954, p. 108, 111.

Principles of system and effects on production. Diagram. (D5)

368-D. Behavior of Hydrogen in Steel Making, General Discussion. W. Oelsen. *Henry Brutcher, Altadena, Calif., Translation no.* 3236, 12 p. (Abridged from *Stahl und Eisen,* v. 73, no. 13, 1953, p. 825-828.)

General discussion of paper of the same title by E. Piper and others (Brutcher Translation no. 3235) and previously abstracted. See item 277-D, 1953. (D general, S11, ST)

369-D. New Experiences in the Production of Pig Iron in the Electric Low-Shaft Furnace. H. Walde. *Henry Brutcher, Altadena, Calif., Translation no.* 3282, 15 p. (Abridged from *Stahl und Eisen,* v. 73, no. 23, 1953, p. 1441-1446.)

Previously abstracted from original. See item 37-D, 1954. (D1, CI)

370-D. Reducing Action of Hydrogen and Carbon Monoxide Upon Iron Oxides at Low Temperatures. A. N. Kuznetsov. *Henry Brutcher, Altadena, Calif., Translation no.* 3300, 16 p. (From *Zhurnal Fizicheskoi Khimii,* v. 27, no. 12, 1953, p. 1808-1815.)

Reactions during initial stage of reduction at temperatures up to 570° C. Graphs, table. 9 ref. (D8, Fe)

371-D. Refining of Steel in the Tapping Spout Between Furnace and Ladle. W. Küntscher and K. Steinheisser. *Henry Brutcher, Altadena, Calif., Translation no.* 3322, 11 p. (From *Metallurgie und Giessereitechnik,* v. 1, no. 2, 1951, p. 40-43.)

Details of the covered Steinheisser tapping spout for openhearth furnaces. Comparison of mechanical

properties with steels produced by ordinary tapping methods. Tables, diagrams. 1 ref.
(D9, D2, Q general, CN)

372-D. Lining of a 900-Ton Hot Metal Mixer With Dolomite Brick. K. Mayer, F. Gareis, S. Kienow, H. Knüppel and G. Trömel. *Henry Brutcher, Altadena, Calif., Translation no.* 3327, 12 p. (Condensed from *Stahl und Eisen,* v. 73, no. 23, 1953, p. 1457-1462.)

Previously abstracted from original. See item 40-D, 1954. (D1)

373-D. (French.) Interfacial Tension Between Slag and Cast and Desulfurization Mechanism. Paul Kozakevitch, Georges Urbain and Max Sage. *Comptes rendus,* v. 239, no. 2, July 12, 1954, p. 166-168.

Suggests that coalescence of sulfur droplets, brought about by increase of tension, influences rate of desulfurization in the blast furnace. Diagrams. 3 ref. (D1, P10, CI)

374-D. (German.) The Oxidation of Molten Ferrous Sulfide. The Processes in the Bessemerizing of Ore. Ernst Justus Kohlmeyer and Klaus Geissler. *Zeitschrift für Erzbergbau und Metallhüttenwesen,* v. 7, no. 7, July 1954, p. 281-283.

Reaction of an iron sulfide melt with a surface blast of oxygen. Formation of ferrous, ferric and sulfur oxides. Tables, graphs. 2 ref. (D3)

375-D. Lackenby Open Hearth Steel Works. II. *Engineer,* v. 198, Aug. 13, 1954, p. 223-225.

Melting shop and other buildings and equipment. Photographs.
(D2, A5, ST)

376-D. Removal of Copper From Iron-Copper-Carbon Alloys. F. C. Langenberg and R. W. Lindsay. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 967-968.

Preliminary results of tests using lead and sodium sulfide to remove residual copper from steel. Tables, 6 ref. (D general, P12, Cu, ST)

377-D. New Dorman Long Steelworks. First Plant in Operation on Lackenby Site. *Metallurgia,* v. 50, no. 298, Aug. 1954, p. 55-62.

Design, equipment and practice in new steel mill integrated with two old plants. Photographs.
(D general, ST)

378-D. Industrial Waste Guide—Blast Furnace Department of the Steel Industry. Hayse H. Black and Gerald N. Mcdermott. *Sewage and Industrial Wastes,* v. 26, Aug. 1954, p. 976-990.

Blast furnace gas cleaning. Volume, character and treatment of liquid wastes. Tables, diagram. 18 ref. (D1, A8)

379-D. (German.) The Waste-Gas Conditions in the Basic Bessemer Steel Plant When Using Blasts of Different Composition. Hans Kosmider, Herbert Neuhaus and Hermann Kratzenstein. *Stahl und Eisen,* v. 74, no. 17, Aug. 12, 1954, p. 1045-1053; disc., p. 1053-1054.

Effect of type of blast, namely ordinary air, oxygen-enriched air and oxygen-water vapor mixture, on heat loss, dust content and iron loss in flue gases. Diagrams, graphs, table, micrographs. 8 ref. (D3, A8)

380-D. (Italian.) Operating Data of Top-Charging Electric Furnaces Recently Installed in the Sisma, Terni, Fiat, Siac, and Dalmine Steelworks. P. Milanesi, G. Castagnola, G. D. Leo, P. Allarme and M. Bevilacqua. *Metallurgia italiana,* v. 46, no. 6, June 1954; *Atti notizie* (AIM), v. 9, no. 6, June 1954, p. 175-182; disc., p. 183-185.

Equipment and experience of various firms. Tables, graphs. (D5, ST)

E
Foundry

512-E. Shell Moulds and Cores. *Automobile Engineer,* v. 44, July 1954, p. 281-284.

Important equipment developments. Photographs. (E16, E21)

513-E. More Automotive Parts by Shell Molding. Joseph Geschelin. *Automotive Industries,* v. 111, Aug. 1, 1954, p. 52-54.

Applications and advantages of a new shell molding variation, contour molding. Photographs. (E16)

514-E. Roto-Cast—a New Centrifugal Casting Process for Canada. *Canadian Metals,* v. 17, July 1954, p. 24, 26, 28, 30.

High-quality products result from control of melt and rate of solidification. Diagrams, micrographs.
(E14, EGa)

515-E. Production of Small Precision Castings. The Investment or "Lost Wax" Process. *Engineering,* v. 178, July 16, 1954, p. 79-80.

Versatility in the use of the lost wax process. Photographs. (E15)

516-E. Dust Problems in Iron Foundries. E. Morgan and P. J. Moseley. *Foundry Trade Journal,* v. 97, July 22, 1954, p. 87-95.

Medical and chemical aspects of air-borne dusts; dust measurements including concentration, size and chemical nature; dust control methods and their efficacy. Diagrams, tables, photographs, graph.
(E general, A8)

517-E. Simple Foundry Expedients Proved Worthwhile in Recent Years. J. E. O. Little. *Foundry Trade Journal,* v. 97, July 22, 1954, p. 99-103.

A collection of ideas to expedite foundry operations. Photographs, diagram. (To be continued.)
(E general)

518-E. Simple Foundry Expedients Proved Worthwhile in Recent Years. J. E. O. Little. *Foundry Trade Journal,* v. 97, July 29, 1954, p. 127-130.

Practical tips on patternmaking, use of dressing stools instead of benches and construction and operation of tumbling barrel for cleaning small castings. Photographs. (E17, L10)

519-E. Casting Grey Iron in Iron Dies. *Machinery (London),* v. 85, July 30, 1954, p. 243-249.

Die-casting machine and its operation. Die-making procedures. Photographs. (E13, CI)

520-E. Gray Iron Shell Mold Castings. Kenneth Rose. *Materials & Methods,* v. 40, Aug. 1954, p. 102-104.

Advantages over sand castings include cost savings and improved quality. Photographs. (E16, CI)

521-E. Foundry Properties of Aluminium Alloy. E. Scheuer, S. J. Williams and J. Wood. *Metal Industry,* v. 85, July 23, 1954, p. 63-65.

Method for effective control of gas content to prevent cracking in castings. Graphs. (E25, Al)

522-E. How Quality Control Can Affect Casting Costs. Roland N. Laveen. *Product Engineering,* v. 25, Aug. 1954, p. 169-171.

Factors to consider in a cost analysis. Tables, diagrams.
(E general, A4)

523-E. (English.) High-Temperature Melting and Pouring of Gray-Iron Castings. II. Ichiro Iitaka and Kazuhiko Sekiguchi. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 1-3.

Effect of pouring temperature on hardness, shrinkage, quality, specific weight and amount of evolved gases. Graphs. (E10, E23, CI)

524-E. (English.) On Heredity of Pig-Iron. I. Effect of Gas-Bubbling Through Molten Iron. Ichiro Iitaka and Kokichi Nakamura. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 4-6.

Effect of gas-bubbling on form, size and distribution of graphite in cast irons. Tables, micrographs. (E25, CI)

525-E. (English.) Spheroidal Cast Iron. Adding Method of Pure Magnesium Block and Magnesium Powder Briquette. Takaji Kusakawa. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 7-10.

Comparison of methods of adding magnesium during production of nodular iron. Diagrams, photographs, tables. (E25, CI)

526-E. (English.) The Strength Measurement of Green Sand Molds. Jiro Kashima and Akihiro Yaguchi. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 27-30.

Compression strength of samples made with various binders. Diagrams, tables, graphs. (E19)

527-E. (English.) The Welding Phenomena Between Solid Steel and Molten Cast Iron. Tsunemitsu Muraki. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 34-38.

Effect of temperature of molten metal on bonding cast iron to steel inserts. Diagrams, tables, micrographs, graphs. (E10, CI)

528-E. (French.) Study of the Cupola Furnace. Use of Nomographs Facilitating Regulation. Edouard Gabel. *Fonderie,* 1954, no. 102, July, p. 4019-4030.

Systematic graphic arrangement of parameters. Regulation of blast, rate of melting, etc. Graphs, photographs, diagrams, nomograph. 7 ref. (E10, CI)

529-E. (French.) Utilization Characteristics of Sand for Molds. Green, Dry, and Synthetic Sands. *Fonderie,* 1954, no. 102, July, p. 4051-4053.

Cohesion, permeability, plasticity, humidification, drying. Advantages and disadvantages of synthetic sand. Table. (E18, CI, Cu)

530-E. (French.) Castings With High Silicon Content. *Fonderie,* 1954, no. 102, July, p. 4054-4055.

Effect of silicon on properties of cast irons. Methods of introducing silicon. 8 ref. (E25, CI)

531-E. (German.) The Present Status in the Development of the Shell-Molding Process in the German Democratic Republic. Reinhart Grochalski. *Metallurgie und Giessereitechnik,* v. 4, no. 6, June 1954, p. 255-264.

Preparation of shell molds, economy and applications. Diagrams, photographs. (E16)

532-E. Some Factors Affecting Metal Penetration of Navy "M" Bronze in Cores. R. B. Fischer. *American Foundrymen's Society, Preprint no.* 54-5, 1954, 11 p.

Effect of static pressure and permeability of cores made from zircon and other sands. Photographs, tables, diagrams. (E21, Cu)

533-E. Theoretical Aspects of Oxygen in Cast Iron. B. B. Bach. *American Foundrymen's Society, Preprint no.* 54-6, 1954, 7 p.

Effects of main constituents of cast iron on oxygen content. All elements normally present (with the possible exception of phosphorus) will reduce oxygen content compared to that of pure iron. Tables, graphs. 29 ref. (E25, CI)

534-E. Improving Surface Finish on Gray Iron Castings. W. G. Parker. *American Foundrymen's Society, Preprint no.* 54-15, 1954, 5 p.

Production of smooth surfaces by using fine molding sands. Effect of grain size and distribution. Photographs, tables. 17 ref. (E18, CI)

535-E. Educating Management to a Valuable Tool. John Taylor. *American Foundrymen's Society, Preprint no.* 54-16, 1954, 4 p.

Use of standard data and job specification sheets in foundries. Examples. (E general, A6)

536-E. Application of Chills to Improving Pressure Tightness of Gun Metal (88-8-4). W. H. Johnson, H. F. Bishop and W. S. Pellini. *American Foundrymen's Society, Preprint no.* 54-21, 1954, 8 p.

Feeding range of gun metal evaluated on basis of pressure tightness developed in a bar casting at various distances from a riser. Graphs, diagrams, radiographs, micrographs. 3 ref. (E23, Cu)

537-E. Some Variables in Acid Cupola Melting. Sam Carter and Ralph Carlson. *American Foundrymen's Society, Preprint no.* 54-22, 1954, 15 p.

Effect of coke size, size distribution and quantity, air volume, and size and shape of steel scrap. Tables, graphs, 3 ref. (E10)

538-E. Segregation in Magnesium-Rare Earths—Zinc-Zirconium Alloys. H. M. Skelly and D. C. Sunnucks. *American Foundrymen's Society, Preprint no.* 54-23, 1954, 9 p.

Light areas on radiographs of castings are shown to be caused by eutectic segregation of relatively high absorption coefficient. Radiographs, micrographs, graphs. 15 ref. (E25, Mg)

539-E. Solidification of Finite Cylinders. V. Paschkis. *American Foundrymen's Society, Preprint no.* 54-31, 1954, 5 p.

Studies of liquidus and solidus isochrones. Tables, graphs. 4 ref. (E25)

540-E. Analysis of Work Content, Time, Distance and Speed at Conveyor Stations. Harry W. Bielefeld. *American Foundrymen's Society, Preprint no.* 54-33, 1954, 6 p.

Time-distance chart studies of foundry operations. Photographs, graphs, diagrams. (E general, A6)

541-E. Selection and Mulling of Synthetic Sands. C. E. Wenninger. *American Foundrymen's Society, Preprint no.* 54-34, 1954, 7 p.

Effect of size and shape of aggregate particles on properties of foundry sands. Diagrams, tables. 4 ref. (E18)

542-E. A Technique for Improving Quality of Investment Castings. D. G. McCullough, F. J. Webbere, and R. F. Thomson. *American Foundrymen's Society, Preprint no.* 54-37, 1954, 6 p.

Technique of casting water in transparent molds for study of fluid flow. Method for reproducing irregular casting shapes in cast plastic mold models. Table, photographs, graphs. (E15)

543-E. A Measured Daywork Program. L. W. Lehmann. *American Foundrymen's Society, Preprint no.* 54-39, 1954, 6 p.

Daywork standards and work loads. Tables, diagram, photograph. (E general, A6)

544-E. Risering of Nodular Iron. I. Risering Semi-Circular Plate Castings. R. C. Shnay and S. L. Gertsman. *American Foundrymen's Society, Preprint no.* 54-40, 1954, 5 p.

Determination of empirical relationships. Feeding requirements. Riser height. Micrograph, graphs, photograph, table. 11 ref. (E22, E23, Fe)

545-E. Research on Shell Molding. R. G. Powell, C. M. Adams, Jr., and H. F. Taylor. *American Foundrymen's Society, Preprint no.* 54-45, 1954, 10 p.

Factors which influence resin consumption in making shell molds studied by means of strength tests. Photographs, graphs, tables, micrographs. 7 ref. (E16)

546-E. An Incentive Plan for "Line" Supervisors. E. D. Bolden. *American Foundrymen's Society, Preprint no.* 54-47, 1954, 8 p.

Principles of operation of multifactor plan for foundries. Waste factors, activity standards and effectiveness quotients. Graphs, tables. (E general, A6)

547-E. Some Effects of Melting Furnace Atmospheres on Tensile Properties and Annealability of Malleable Iron. G. E. Kempka and R. W. Heine. *American Foundrymen's Society, Preprint no.* 54-50, 1954, 16 p.

Free oxygen in melting furnace atmosphere resulted in increased resistance to first and second stage graphitization and lowered tensile properties. Tables, photographs, graphs. (E10, Q23, J23, CI)

548-E. Investment Casting by the Frozen Mercury Process. I. R. Kramer. *American Foundrymen's Society, Preprint no.* 54-52, 1954, 3 p.

Advantages; mold preparation. Diagrams, photographs. (E15)

549-E. Zircon Sands—Occurrence and Uses in Australian Industry. Paul Markwell. *American Foundrymen's Society, Preprint no.* 54-53, 1954, 4 p.

Mineralogy, properties and foundry appliations. Tables. (E18)

550-E. Correlation of Air Furnace Bottom Temperature to Refractory and Operating Practice in a Cupola-Air Furnace Duplex System. F. W. Jacobs and E. C. Ashley. *American Foundrymen's Society, Preprint no.* 54-55, 1954, 13 p.

Practical study of variables affecting refractory bottom life in an oil-fired air furnace as related to bottom temperatures. Slag treatment and control. Tables, graphs, photographs. 1 ref. (E10)

551-E. Statistical Analysis of Factors Affecting Casting Finish. D. C. Ekey and J. E. Goldress. *American Foundrymen's Society, Preprint no.* 54-56, 1954, 8 p.

Effect of sand fineness, mold hardness, metal pressure and wood flour on surface roughness of aluminum castings. Tables, diagrams, photographs. (E18, E19, S12, Al)

552-E. Development of Cupola Melting Equipment. W. R. Jaeschke. *American Foundrymen's Society, Preprint no.* 54-49, 1954, 14 p.

Charging and weighing mechanisms, hot blast equipment, dust collectors and water cooling. Photographs, diagrams. 8 ref. (E10)

553-E. Another Look at Sand Grain Distribution. B. H. Booth and C. A. Sanders. *American Foundrymen's Society, Preprint no.* 54-59, 1954, 8 p.

Importance of control. Critical review of tests and terminology. Photographs, graphs, tables. 42 ref. (E18)

554-E. Heat Transfer of Various Molding Materials for Steel Castings. Charles Locke and C. W. Briggs. *American Foundrymen's Society, Preprint no.* 54-61, 1954, 11 p.

Chilling ability was rated by means of cooling curves of castings. Tables, photographs, graphs. 7 ref. (E25, CI)

555-E. Solidification of Various Metals in Sand and Chill Molds. F. A. Brandt, H. F. Bishop and W. S. Pellini. *American Foundrymen's Society, Preprint no.* 54-62, 1954, 7 p.

Solidification characteristics determined by thermal analysis. Photograph, diagram, tables, graphs. 6 ref. (E25)

556-E. Studies of Chill Action. E. T. Myskowski, H. F. Bishop and W. S. Pellini. *American Foundrymen's Society, Preprint no.* 54-64, 1954, 5 p.

Chills were applied to center portion of long 4 x 4-in. bars cast of 0.30% carbon steel. Resulting changes in solidification conditions determined by thermal analysis. Diagrams, graphs. 6 ref. (E25, CI)

557-E. Core Blowing Problems. John A. Mescher. *American Foundrymen's Society, Preprint no.* 54-65, 1954, 5 p.

Maintenance of boxes, reduction of set-up time and high-speed production. Photographs, diagrams. (E21)

558-E. Metal Penetration Tests on Dry Sand Cores and Core Washes. *American Foundrymen's Society, Preprint no.* 54-69, 1954, 4 p.

Prevention of metal penetration by use of silica and graphite core washes. Tables, diagrams, photographs. 2 ref. (E21)

559-E. Effect of Centrifugal Force on Structure and Mechanical Properties of Aluminum Casting Alloy C4. O. Z. Rylski, A. Couture and J. W. Meier. *American Foundrymen's Society, Preprint no.* 54-70, 1954, 11 p.

Apparatus described allows casting to solidify without turbulence under known conditions of centrifugal force and hydrostatic pressure. Above 700 r.p.m. mechanical properties exceed those of billets cast under the same conditions but without rotation. Photographs, graphs, micrographs, tables. (E14, Q general, M27, Al)

560-E. Stress Required to Hot Tear Plain Carbon Cast Steel. U. K. Bhattacharya, C. M. Adams, Jr., and H. F. Taylor. *American Foundrymen's Society, Preprint no.* 54-78, 1954, 11 p.

Apparatus measures stress in a steel casting cooling under conditions of hindered contraction. Tearing stresses were measured at temperatures ranging from 1700 to 2500° F. for plain carbon steels of various compositions. Graphs, diagram, photographs, tables, micrographs. 10 ref. (E25, Q25, CI)

561-E. Shell Molding Copper-Base Alloys. S. S. Brown and H. K. Worner. *American Foundrymen's Society, Preprint no.* 54-79, 1954, 4 p.

Fields where shell molding has been found to be effective in Australia. Problems of gating and feeding. Aspects of design for shell molded castings. Photographs, diagrams. (E16, E22, E23, Cu)

562-E. Cupola Fly-Ash Suppression. R. M. Ovestrud. *American Foundrymen's Society, Preprint no.* 54-82, 1954, 2 p.

Operating experience with a water curtain-type cupola dust collector system. Photographs. (E10, A8)

563-E. Experiences With the Use of a Spray Type Collector on a 72-In. Cupola. A. G. Tompkins. *American Foundrymen's Society, Preprint no.* 54-83, 1954, 4 p.

Operating characteristics, collector efficiency and air pollution tests. Diagrams, graph, photographs. (E10, A8)

564-E. Air Pollution Control Equipment for the Cupola. D. E. Gilchrist. *American Foundrymen's Society, Preprint no.* 54-94, 1954, 8 p.

Centrifugal and inertia-type dust collectors, scrubbers, bag filters and electrostatic precipitators. Waste heat recuperators. Diagrams, tables, graphs. (E10, A8)

565-E. Indirect Arc Melting of Bronze and Brass. G. C. Behrends. *Canadian Metals,* v 17, Aug. 1954, p. 22, 28.

Advantages in quality of product and low costs of operation. (E10, Cu)

566-E. Metal Pattern Production by the Shell Mold Process. Clarence R. Dutton. *Canadian Metals,* v. 17, Aug. 1954, p. 26-27.

Advantages, equipment and methods. Photographs. (E16)

567-E. Design and Operation of a Modified Cupola. F. A. Woolley. *Foundry Trade Journal,* v. 97, Aug. 5, 1954, p. 143-149.

Design and operation of electrically heated well. Improved temperature and composition control. Tables, photographs, diagram. 6 ref. (E10)

568-E. Centrifugal Die-Casting in Rubber Moulds. *Foundry Trade Journal,* v. 97, Aug. 5, 1954, p. 151-152.

Methods suitable for low melting point alloys. Photograph. (E13)

569-E. Automatic Molding Machine Lowers Foundry Handling Costs. W. G. Patton. *Iron Age,* v. 174, Aug. 12, 1954, p. 109-111.

Manual handling of bulky flasks and finished molds is eliminated by a fully automatic molding machine recently installed at Buick. Photographs, table. (E19)

570-E. "Mechanical World" Flowsheet No. 248. Shell Moulding. J. Zeelander. *Mechanical World and Engineering Record.* v. 134, Aug. 1954, p. 372-373.

Various steps in production of finished castings. (E16)

571-E. Foundry Properties of Aluminium Alloy. E. Scheuer, S. J. Williams and J. Wood. *Metal Industry,* v. 85, July 16, 1954, p. 47-49, 52.

Effects of gas content on shrinkage of die castings. Photographs, micrographs, table, diagram. 4 ref. (To be continued.) (E13, E25, Al)

572-E. White-Metalling Bearings. *Metal Industry,* v. 85, Aug. 6, 1954, p. 109-110.

Specialized production of rolling stock bearings by pressure casting. Photographs, diagram. (E13, Sn, Pb, Sb, Cu)

573-E. Take a Close Look at Investment Casting. *Steel,* v. 135, Aug. 23, 1954, p. 104-105.

Application, versatility, cost and advantages of process. Photographs. (E15)

574-E. (German.) **Prerequisites for Production of Spheroidal Graphite Cast Iron, Its Properties and Uses.** K. Löhberg. *Henry Brutcher, Altadena, Calif., Translation no.* 3173, 15 p. (Condensed from *Stahl und Eisen,* v. 73, no. 4, 1953, p. 212-218.)

Previously abstracted from original. See item 258-E, 1953. (E25, CI)

575-E. (Czech.) **Study of Some Properties of Organic Binders.** Jiri Ornst. *Slévarenství,* v. 2, no. 6; *Prace Ceskoslovenského Vyzkumu Slévarenského,* v. 1, no. 5, June 1954, p. 37-44.

Tests on effects of various oils, dextrin and clay combinations on casting quality. Graphs, photographs, tables. 59 ref. (E18)

576-E. (Czech.) **Inoculation of Cast Iron With Magnesium in an Autoclave.** Zdeněk Hostinsky and Cestmir Hlousek. *Slévarenství,* v. 2, no. 6; *Prace Ceskoslovenského Vyzkumu Slévarenského,* v. 1, no. 6, June 1954, p. 45-50.

Addition of magnesium at 1350 to 1360° C. under four to six atmospheres occurred with no boiling or spatter. Recovery of magnesium was high. Tables, graphs, diagrams, photographs, micrographs. 3 ref. (E25, CI)

577-E. (Czech.) **Pouring of Steel in Chill Molds.** Alois Sustek. *Slévarenství,* v. 2, No. 6; *Prace Ceskoslovenského Vyzkumu Slévarenského,* v. 1, no. 7, June 1954, p. 51-56.

Design of molds to allow for shrinkage and gas removal. Effects of mold temperature on mechanical properties of castings. Tables, graphs, photographs, micrographs, diagram, radiographs. 14 ref. (E23, Q general, CI)

578-E. (Czech.) **Hydrogen as the Cause of Porosity in Aluminum and Its Alloys.** Antonin Fiala and Zdena Tolarova. *Slévarenstvi,* v. 2, no. 6, June 1954, p. 162-167.

Vacuum extraction and additions of sulfur monochloride were used to trace formation of blow holes. Tables, graph, photographs, diagram. 6 ref. (E25, Al)

579-E. (Czech.) **Technical Foundry Development in Czechoslovakia.** Bohuslav Krizko. *Slévarenstvi,* v. 2, no. 6, June 1954, p. 167-170.

Review of status in 1945, subsequent development and future requirements. Diagram, graphs, tables. (E general)

580-E. (Czech.) **Molding of Wheels for Mine Trucks.** Vlastimil Pastor. *Slévarenstvi,* v. 2, no. 6, June 1954, p. 174-176.

Gating changes which produced sounder castings, increased production and lowered costs. Diagrams. (E22, CI)

581-E. White Collar Foundry. L. J. Bishop. *Flow,* v. 9, Sept. 1954, p. 76 + 9 pages.

Advantages of shell molding over conventional processes and automatic production of molds. Photographs, diagram. (E16)

582-E. Solving Problems in the Brass Foundry. Harold J. Roast. *Foundry,* v. 82, Sept. 1954, p. 106-107, 222, 224.

Operations to be analyzed to insure highest quality castings. Photograph. (E general, Cu)

583-E. Malleable Foundry Modernizes Facilities. Edwin Bremer. *Foundry,* v. 82, Sept. 1954, p. 108 + 9 pages.

Changes in equipment and practice. Diagram, photographs. (E general, CI)

584-E. Design and Dimensional Control for Investment Castings. R. L. Wood. *Foundry,* v. 82, Sept. 1954, p. 120 + 4 pages.

Interrelationships of casting design and dimensional accuracy. Photographs, graph. (E15)

585-E. A Plan for Productive Maintenance. Jack C. Miske. *Foundry,* v. 82, Sept. 1954, p. 122 + 5 pages.

Steps to reduce downtime and production costs. Photographs. (E general, A6)

586-E. How to Make a Casting When You Can't Get the Core Out. *Foundry,* v. 82, Sept. 1954, p. 155, 158.

Combination of casting and welding to simplify production of complex unit. (E general, K general, CI)

587-E. Modern Production of Whiteheart Malleable Iron. Jeffrey Bernstein. *Foundry Trade Journal,* v. 97, Aug. 12, 1954, p. 169-178.

Equipment and operating procedures. Coremaking, melting, control measures, inspection and annealing. Photographs, micrographs, table. (E11, J23, CI)

588-E. Cupola Development. First Report of Sub-Committee T.S. 43 of the Technical Council. E. S. Renshaw, chairman. *Institute of British Foundrymen, Paper no.* 1089, 1954, 12 p.

Developments in hot blast cupola operation, hot and cold blast operation compared, water-cooled cupolas, desulfurizing and carburising in the basic cupola. Tables, diagrams, graphs. 17 ref. (E10, CI)

589-E. Design and Operation of a Modified Cupola. F. A. Woolley. *Institute of British Foundrymen, Paper no.* 1090, 1954, 7 p.

Normal cupola furnace, as used for continuous melting of high-duty gray iron in manufacturing automobile castings, is modified by providing auxiliary electric heating to the well. Diagram, photographs, tables. 6 ref. (E10, CI)

590-E. Cupola Practice: Second Thoughts. W. Y. Buchanan. *Institute of British Foundrymen, Paper no.* 1091, 1954, 10 p.

History of particular cupola design and recent improvements including lining life, pneumatic patching, furnace technique, methods of charging and use of spark arresters. Graph, photographs, diagrams. (E10, CI)

591-E. Theory, Economics and Practical Application of Exothermic Materials. D. V. Atterton and C. Edmonds. *Institute of British Foundrymen, Paper no.* 1092, 1954, 11 p.

Feeding of nonferrous and ferrous castings. Tables, photographs, diagrams, graph. 11 ref. (E23)

592-E. Cut Cupola Charge Costs With Fine Metal Scrap. W. M. Halliday. *Iron Age,* v. 174, Aug. 26, 1954, p. 106-108.

Enclosing borings, chips and other fine metal particles in sheet metal cans eliminates loss in the blast and by excessive oxidation. Diagram. (E10, CI)

593-E. New Die Casting Plant Features Melting, Handling Economies. G. B. Nyselius. *Iron Age,* v. 174, Sept. 2, 1954, p. 108-111.

Efficient and continuous cycle for production of zinc and aluminum die castings. Photographs, diagram. (E13, Ze, Al)

594-E. Plaster Moulds for Casting Aluminium by Pressure and Gravity. *Machinery (London),* v. 85, Aug. 20, 1954, p. 393-395.

Process, recommendation for its use. Diagrams. (E16, Al)

595-E. Cast-Weld Construction Bypasses Complications. G. L. Gibson. *Steel,* v. 135, Sept. 6, 1954, p. 96-97.

Advantages of combining welding and casting for large, complex shapes. Photographs. (E general, K general, CI)

596-E. (Dutch.) **"Metalock" on Shrinkage Cracks and Casting Defects.** *Metalen,* v. 9; *Handel en Industrie,* v. 9, no. 14, July 31, 1954, p. 122-123.

Repair method on castings with wall thickness from 8 mm. to 20 cm., where welding is often impossible. Diagrams, photographs. (E25)

597-E. (French.) **"Synthetic" Cast Iron and Its Use. Malleable Cast Iron and Nodular Cast Iron.** Marcel Guedras. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 285, 287.

Production methods. Applications. (E11, CI)

598-E. (German.) **Recent Development in the Field of Centrifugal Casting.** Hugo Dettela. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben,* v. 99, no. 7, July 1954, p. 121-132.

Centrifugal casting and factors to be considered in use of chill and sand molds. Diagrams, graphs, photographs, tables. 7 ref. (E14)

599-E. (German.) **Italian Production of Nodular Cast Iron by Means of Metallic Magnesium.** Carlo Longaret-

ti. *Giesserei*, v. 41, no. 16, Aug. 5, 1954, p. 410-412.

Process based on development of magnesium vapors of controllable intensity in iron bath. Treatment with magnesium wire or shavings. Diagrams. (E25, CI)

600-E. (German.) **Advances in Foundry Practice in the 2nd Half of 1953.** Paul A. Heller. *Stahl und Eisen*, v. 74, no. 17, Aug. 12, 1954, p. 1081-1085.

Review of literature. Graphs. 85 ref. (E general)

F

Primary Mechanical Working

304-F. Mile a Minute Rod Mill. D. L. Siegelin. *Blast Furnace and Steel Plant*, v. 42, Aug. 1954, p. 928-933.

Equipment and operating procedures. Photographs, diagrams, table. (F27, CN)

305-F. Rare Earths Counteract Hot Rolling Defects in Stainless Steel. R. H. Henke and R. A. Lula. *Journal of Metals*, v. 6, Aug. 1954, p. 883-888.

Behavior of martensitic, ferritic and austenitic steel with respect to conversion of ingots into hot rolled semifinished products. Micrographs, tables, graphs, photograph. 1 ref. (F23, B22, SS)

306-F. Stock Straighteners Come of Age. William Hyams. *Machine and Tool Blue Book*, v. 49, June 1954, p. 151-158.

Methods and equipment for straightening tubing. Photographs. (F29)

307-F. Stretching Hot-Rolled Bars Produces Cold-Drawn Properties. J. A. Helget. *Machinery*, v. 60, Aug. 1954, p. 162-164.

Development, operation and features of a bar-stretching machine. Photographs. (F29, ST)

308-F. In-Process Machining of Large Aluminum Forgings. Alfred H. Petersen. *Metal Progress*, v. 66, Aug. 1954, p. 81-88.

Analysis of problems encountered in production of large forgings. Recommends rough machining after blocking and before finish forging. Graphs, photographs, diagrams, table. (F22, G17, Al)

309-F. The Rolling of Metals and Alloys. II. Principles Underlying the Design, Use and Reproduction of Roll Cambers. E. C. Larke. *Sheet Metal Industries*, v. 31, no. 328, Aug. 1954, p. 699-703.

Calculation of required camber, approximate formulas. Diagrams, tables, graph. 3 ref. (To be continued.) (F23)

310-F. Forging Titanium—A Prescription for Production Headaches. James J. Russ. *Steel*, v. 135, Aug. 16, 1954, p. 100-101.

Critical check points are design, die sinking and raw materials. Material, though sluggish, evidences normal flow characteristics. Tendency is to extrude through thin sections. Photographs. (F22, Ti)

311-F. The Importance of Lime in Wire Drawing. Thomas C. Miller. *Wire and Wire Products*, v. 29, Aug. 1954, p. 843 + 8 pages.

Characteristics and uses of various types of lime. Tables. 3 ref. (F28)

312-F. Wire Flattening—An Appraisal of Today's Theory and Practice. I. Wire Flattening Theory. A. I. Nussbaum. *Wire and Wire Products*, v. 29, Aug. 1954, p. 857-859, 916-917.

Methods of determining spread, wire size and mill power requirements. Graphs. (F29)

313-F. The Production of Fine Tungsten Wire. *Engineering*, v. 178, Aug. 6, 1954, p. 174-178.

Chemical processes and mechanical operations in manufacture. Similar applications to molybdenum. Photographs. (F28, W, Mo)

314-F. Some Factors Affecting the Quality of Extrusions. II. Christopher Smith and Norman Swindells. *Industrial Heating*, v. 21, Aug. 1954, p. 1518 + 4 pages.

Press design, tools, effect of extrusion speed. Table, diagram. (To be continued.) (F24, Al, Cu)

315-F. The Calculation of Roll Force and Torque in Hot Rolling Mills. R. B. Sims. *Institution of Mechanical Engineers, Proceedings*, v. 168, no. 6, 1954, p. 191-200.

Equations derived for normal pressure, specific roll load and torque in hot rolling mills, using the condition for plastic deformation in rolling derived by Orowan, together with von Karman's equation of equilibrium. Tables, graphs, macrograph, photograph. 13 ref. (F23, Q24)

316-F. Measurement and Analysis of Rolling Loads in a Large Hot Plate Mill. R. Stewartson. *Institution of Mechanical Engineers, Proceedings*, v. 168, no. 6, 1954, p. 201-208; disc., p. 209-214.

Load indications for plates of different sizes analyzed and compared with three roll load formulas. Tables, photograph, graphs, diagrams. 5 ref. (F23)

317-F. Portable Plug-In Elements Heat Magnesium Forming Dies. R. W. Peters. *Iron Age*, v. 174, Aug. 12, 1954, p. 112-113.

Use of rod-type resistance heaters results in lower costs and increased efficiency and saftey. Photographs. (F21, Mg)

318-F. Internal Temperature Distribution in the Cooling and Reheating of Steel Ingots. R. J. Sarjant and M. R. Slack. *Iron and Steel Institute, Journal*, v. 177, Aug. 1954, p. 428-444.

Relation of track time and reheating practice to thermal efficiency and temperature saturation necessary for good rolling based on thermal history calculations. Diagrams, tables, graphs. 32 ref. (F21, ST)

319-F. Controls and Safety Devices of Heavy Presses. E. V. Crane and W. R. Jackson. *Mechanical Engineering*, v. 76, Aug. 1954, p. 636-639.

Particular reference made to the Air Force 25,000-ton capacity press. Diagrams. (F22, A7)

320-F. Forging of Aircraft Gas Turbine Blades. L. M. Raring. *Steel Processing*, v. 40, Aug. 1954, p. 487-494, 526.

Raw material inspection, forging sequence, heat treatment, finishing and testing. Photographs. (F22, J general, L general, S general, SS)

321-F. New 14,000 Ton Extrusion Press in Operation. *Steel Processing*, v. 40, Aug. 1954, p. 495-499, 528.

Design of press, production experience and auxiliary processing of aluminum extrusions. Diagrams, photographs, table. (F24, Al)

322-F. The Use of High-Frequency Current for the Through Heating of Steel Bars. V. P. Vologdin. *Henry Brutcher, Altadena, Calif., Translation no.* 3288, 15 p. (Condensed from *Izvestiya Akademii Nauk SSSR*, 1953, no. 1, Jan., p. 3-15.)

Applications of induction heating frequencies used for various bar sizes and current sources. Table, photographs. (F21, ST)

323-F. (French.) **Researches on a Defect That Appears in the Rolling of 67:33 Brass (Phantom Lamination).** Jean R. Maréchal. *Revue de métallurgie*, v. 51, no. 7, July 1954, p. 441-458.

Cracks which appear only on thick sheets (above several mm.) and disappear on further work (cold rolling with intermediate anneals) are caused by secondary formation of beta phase. Photographs, micrographs, tables, diagram. 6 ref. (F23, Cu)

324-F. (Japanese.) **Copper Alloy Extrusion and Drawing.** S. Yamaguchi. *Metals (Japanese)*, v. 24, no. 7, July 1954, p. 520-523.

Techniques. Mechanical characteristics of pipes and other extruded products. Diagrams, tables. 6 ref. (F24, Q general, Cu)

325-F. Wire Drawing Lubricants (Practical Lubrication No. 14). L. Salz. *Lubrication Engineering*, v. 10, July-Aug. 1954, p. 190-192.

Reviews practices for ferrous and nonferrous applications. Table. (F1, F28)

326-F. On the Development of Cracks in the Rotary Swaging of Steel Wire. W. Püngel. *Henry Brutcher, Altadena, Calif., Translation no.* 2834, 3 p. (From *Stahl und Eisen*, v. 71, no. 22, 1951, p. 1137-1140.)

Previously abstracted from original. See item 22-F, 1952. (F28, ST)

327-F. How to Understand Cold Working of Metals. Samuel Storchheim. *American Machinist*, v. 98, Aug. 30, 1954, p. 101-108.

Effects of processing operations on microstructure and properties. Micrographs, graphs, diagrams, photographs. (F general, G general, M27)

328-F. The 11-In. Continuous Bar Mill at the Roundwood Works of the Park Gate Iron & Steel Company, Limited. *British Steelmaker*, v. 20, Aug. 1954, p. 310-318.

Equipment, plant layout and operating procedures. Photographs, diagrams, tables. (F23)

329-F. Recent Rolling Mill Practices Indicate Trend of Future Investigations. N. H. Polakowski. *Journal of Metals*, v. 6, Sept. 1954, p. 954-958.

Practical and theoretical aspects of rolling metals with various types of equipment. New mill designs. Photographs, graphs. 32 ref. (F23)

330-F. Method of Sheathing Power Cables With Aluminium. *Machinery (London)*, v. 85, Aug. 20, 1954, p. 391-392.

New press for continuous extrusion to any length. Photograph, diagram. (F24, Al)

331-F. Wire Flattening. A Lower-Cost Narrow Strip Producer. A. I. Nussbaum. *Steel*, v. 135, Sept. 6, 1954, p. 104, 106, 109.

Equipment and techniques for producing close tolerance strip. Photographs, diagram. (F29)

332-F. Die Design. How to Save Development Time. Bernard K. H. Bao. *Tool Engineer*, v. 33, Sept. 1954, p. 65-68.

Use of the Pappus (or Guldinus) theorem to calculate necessary dimensions of draw or extrusion dies. Diagrams. (F24, G4)

333-F. Old Ways and New. J. F. Mayberry and T. G. Lutz. *Welding Engineer*, v. 39, Sept. 1954, p. 36-38.

Description and use of a four-side hot slab scarfing machine. Photographs, table. (F21)

334-F. (French.) **Glass Is a Lubricant in Metallurgical Operations.** Ivan Peyches and J. Séjournet. *Verres et réfractaires,* v. 8, no. 3, May-June 1954, p. 131-135.

Use of glass as a lubricant in the extrusion of steel. Photographs, diagrams, graph. (F1, F24, ST)

335-F. (German.) **Possibilities in the Mathematical Determination of the Flow Process in Standard Rolled Shapes.** Z. Wusatowski and R. Wusatowski. *Metallurgie und Giessereitechnik,* v. 4, no. 7, July 1954, p. 295-307.

Simplified method computes applied pressure and flow of steel in lateral and longitudinal directions and designs new rolls. Diagrams, nomograms, tables. 10 ref. (F23, ST)

336-F. (German.) **Principles of Synchronizing Continuous Rolling Trains and Computing Rolling Rates.** Z. Wusatowski. *Metallurgie und Giessereitechnik,* v. 4, no. 7, July 1954, p. 308-310.

Mathematical analysis. Tables. 5 ref. (F23)

337-F. (German.) **The New Wire-Drawing and Billet-Rolling Mill of the N.V. Netherlandsche Kabelfabrieken, Delft.** Georg Leder. *Stahl und Eisen,* v. 74, no. 17, Aug. 12, 1954, p. 1076-1079.

Description. Photographs, diagrams. 2 ref. (F28, F23, ST)

338-F. (French.) **Furnaces for Large Forgings.** J. E. Lafon. *Metallurgie et la construction mécanique,* v. 86, nos. 7-8, July-Aug. 1954, p. 585, 587-591.

Improvements in tunnel and batch-type heating equipment. Diagrams. (F21, F22)

G
Secondary Mechanical Working

469-G. Chip-Control. L. Fine. *Aircraft Production,* v. 16, Aug. 1954, p. 296-300.

Methods for machining with carbide-tipped tools. Photograph, diagrams, table. 4 ref. (G17)

470-G. Developments in Deep-Hole Boring. III. Rotating-Bar and Stationary-Bar Boring; Determining Cutter-Head Performance: Trepan-Boring Head Design and Performance. H. J. Pearson. *Aircraft Production,* v. 16, Aug. 1954, p. 326-336.

Machining tests, tool planforms, cutting fluids and coolants. Photographs, graphs, tables. (G17, G21, SS, ST)

471-G. Electric Spark Machining. *Automobile Engineer,* v. 44, July 1954, p. 295-297.

Sparcatron process for working hard materials. Photographs. (G17)

472-G. Titanium Fasteners Study. Harry S. Brenner. *Light Metal Age,* v. 12, Aug. 1954, p. 10-11, 30.

Production and evaluation of bolts. Heading and machining operations. Graph, photograph. (G10, G17, T7, Ti)

473-G. Chemical Milling. New Process for Etching Aluminum. *Light Metal Age,* v. 12, Aug. 1954, p. 20-21, 35.

Advantages and techniques of forming method. Photographs, diagrams. (G17, Al)

474-G. Troubles Encountered With Tools Most Commonly Used in Cutting Stainless Steel. *Machine and Tool Blue Book,* v. 49, June 1954, p. 193, 195-196, 198.

Reference sheets giving tool troubles and remedies. (G17, SS)

475-G. Automatic Controls for Indexing Operations. Floor-to-Floor Time Reduced 10-20%. Walton Rainey. *Machine and Tool Blue Book,* v. 49, June 1954, p. 213-218.

Servo-system for positioning turrets on punch press. Photograph, diagram. (G2)

476-G. Planning Machine Series. II. Paolo Tedeschi. *Machine Design,* v. 26, Aug. 1954, p. 163-174.

Theory and application of analytical techniques for series planning. Tables, graphs. 1 ref. (To be continued.) (G17, S12)

477-G. Unit Engineering of Multiple Drilling and Tapping Equipment. Melvin H. Emrick. *Machinery,* v. 60, Aug. 1954, p. 165-168.

Standardization of multiple-head components, chucks and fixture design account for success of method. Photographs. (G17)

478-G. Central Coolant Supply Serviced by Coarse-Screen Filter. John W. Fauver. *Machinery,* v. 60, Aug. 1954, p. 169-171.

Provides a more consistent product finish, decrease in replacement costs and reduction in man-hours previously allotted to cleaning out machine sumps. Photographs. (G21)

479-G. Soluble Oil Cutting Fluids. R. K. Gould. *Machinery,* v. 60, Aug. 1954, p. 186-189.

Stable emulsion formed when mixed with water provides variety of cooling and lubricating properties by changing oil-water ratio. (G21)

480-G. Experience Accumulates on Drawing Titanium. Carter C. Higgins. *Machinery,* v. 60, Aug. 1954, p. 193-195.

Commercially pure titanium can be successfully drawn at room temperatures. Photographs. (G4, Ti)

481-G. Magnetic Tape Control of Machine Tools. C. K. Marklew. *Machinery Lloyd (Overseas Ed.),* v. 26, July 17, 1954, p. 70-76.

Automatic control over dimensions and function. Theory and application. Photographs, diagrams. (G17)

482-G. Automatic Control of Machine Tools. D. T. N. Williamson. *Machinery Lloyd (Overseas Ed.),* v. 26, July 17, 1954, p. 77-83.

Method of reducing machine functions to coded data by digital computers. Diagrams. (G17)

483-G. Alumina-Tipped Cutters. (Digest of "Ceramic-Tipped Cutting Tools," by K. J. B. Wolfe; 5th International Mechanical Engineering Congress, 1953). *Metal Progress,* v. 66, Aug. 1954, p. 143-144.

Properties and case histories of use. (G17)

484-G. The Forming of Aluminium Sheet. VII. Stretch-Forming. H. Hinxman. *Sheet Metal Industries,* v. 31, no. 328, Aug. 1954, p. 673-678.

Equipment and techniques. Photographs, diagrams. (To be continued.) (G9, Al)

485-G. (French.) **Reflections on the "Drawability" of Sheet Metal. III.** Pierre Vauthier. *Métaux, Corrosion-Industries,* v. 29, no. 346, June 1954, p. 242-258.

Deformation imposed by advance of die, autonomous field of residual internal stresses, breaking load, preferential orientations. Graphs, diagrams, tables. (G4, Q25)

486-G. (French.) **Contribution to the Study of Oxy-Acetylene Cutting.** Jean-Marie Morelle. *Revue de la Soudure* (Brussels), v. 10, no. 2, 1954, p. 105-118.

Effects of cracks, slag, oxygen flow, temperature, pressure and composition of metal. Tables, photograph, graphs, diagrams. (G22)

487-G. Machining Characteristics of Cast Irons. Michael Field and John F. Kahles. *American Foundrymen's Society, Preprint no.* 54-73, 1954, 6 p.

Effect of microstructure on cutting characteristics. Micrographs, tables, diagram, graphs. (G17, M27, CI)

488-G. Cope Talks on Draw Dies. XVII. Choose From 4 Methods to Bulge Shells. Stanley R. Cope. *American Machinist,* v. 98, Aug. 16, 1954, p. 122-125.

Design of bulging dies. Rules for calculating the shell. Diagrams. (To be continued.) (G14)

489-G. Evaluation of Bandsaw Performance. L. V. Colwell and R. E. McKee. *ASME, Transactions,* v. 76, Aug. 1954, p. 951-959; disc. p. 959-960.

Test conditions and procedure, tool life, cutting forces. Graphs, tables, photographs, diagrams. (G17, ST, Ti)

490-G. Cutting With Single Point Tools. John Wragg. *Edgar Allen News,* v. 33, Aug. 1954, p. 169-172.

Tool selection, grinding and wear. Coolants. Graph, photograph, micrograph. (G17, G18, G21)

491-G. The Grinding of Steel. XIX. Superfinishing. *Edgar Allen News,* v. 33, Aug. 1954, p. 181-182.

Types of abrasives and their use. Graph, table. (To be continued.) (G18, G19, ST)

492-G. Future Transistor Applications in Machine-Tool Control. R. L. Bright. *Instruments and Automation,* v. 27, Aug. 1954, p. 1296-1298.

High sensitivity of phototransistors can open new fields in machine tool control. Diagrams, graph. (G17)

493-G. Trepanning Cuts Hole Making Costs. A. G. Haglund. *Iron Age,* v. 174, Aug. 12, 1954, p. 120-121.

Examples of trepanning efficiency. Photographs. (G17)

494-G. Powder Processes Solve Tough Metal Removal Problems. III. R. S. Babcock. *Iron Age,* v. 174, Aug. 12, 1954, p. 122-124.

Introduction of iron powder into the reaction zone of an oxy-acetylene flame speeds metal removal. Powder washing and lancing. Diagram, photographs. (G22)

495-G. Cold Hobbing of Mould and Die Cavities. *Machinery (London),* v. 85, Aug. 6, 1954, p. 263-271.

Methods, applications and advantages. Photographs. (G17, ST)

496-G. Some Examples of Metal Spinnings. *Machinery (London),* v. 85, Aug. 6, 1954, p. 275-279.

Applications and advantages of process. Photographs. (G13)

497-G. Lubrication in the Cutting of Metals. Antoni Niedzwiedzki. *Machinery (London),* v. 85, Aug. 6, 1954, p. 280-286.

Selection of cutting fluids on basis of cutting conditions and type of machining or grinding operation to be performed. Tables. 12 ref. (G21, G17, G18)

498-G. Spark Machining. *Mechanical World and Engineering Record,* v. 134, Aug. 1954, p. 352-356.

Equipment and operating procedures. Photographs, diagrams. (G17)

499-G. Cutting Tools and Lubricants. *Mechanical World and Engineering Record,* v. 134, Aug. 1954, p. 374-376.

Basic relationships between tool, material and cutting fluid. Diagrams, tables. (G17, G21)

500-G. Mechanics of Tool Engineering. IV. Tooling the Milling Machine.

Andrew E. Rylander. *Western Machinery and Steel World*, v. 45, Aug. 1954, p. 77-80.

Use of auxiliary tooling and vacuum chucks. Photographs, diagrams. (G17)

501-G. Titanium: Machining Recommendations. L. O. Montgomery. *Western Machinery and Steel World*, v. 45, Aug. 1954, p. 81-83.

Tools, milling, drilling, tapping, grinding, sawing and reaming. Tables, photograph. (G17, G18, Ti)

502-G. Torch Cutting Titanium Before Machining Speeds Operation, Gives Good Results. C. W. Snyder and F. D. Wallace. *Western Metals*, v. 12, Aug. 1954, p. 54-56.

Materials savings made by torch cutting prior to machining. Favorable results obtained with right methods, heavy equipment properly manned. Photographs. (G22, G17, Ti)

503-G. Electrosparking Process for Grinding Carbide-Tipped Profile Cutters. F. F. Cherepanov. *Henry Brutcher, Altadena, Calif., Translation no.* 3040, 4 p. (From *Stanki i Instrument*, v. 23, no. 4, 1952, p. 31-32.)

Reduction of grinding time and elimination of cracking and chipping due to grinding. Optimum conditions for maximum production. Table, diagrams. (G18, C-n)

504-G. (Japanese.) **Improvements in Impact Extrusion Methods.** *Metals (Japanese)*, v. 24, no. 7, July 1954, p. 513-519.

Deformations and work hardening during forming of cups in various metals. Photographs, graphs, diagrams. (G5, AY, Cu, Al)

505-G. (Russian.) **Mechanism of Action of Active Media During Machining of Metals.** G. I. Epifanov, N. A. Pleteneva, and P. A. Rebinder. *Doklady Akademii Nauk SSSR*, v. 97, no. 2, July 11, 1954, p. 277-279.

Changes in metal microstructure and properties caused by absorption of materials from cutting fluids. 13 ref. (G17, M27)

506-G. Work Cuts Tool, Tool Forms Work With Ultrasonics. E. J. Tangerman. *American Machinist*, v. 98, Aug. 30, 1954, p. 85-88.

Ultrasonic machining of carbide-type rolling dies. Photographs. (G17)

507-G. Trepanning Titanium Saves Time and Material. S. E. Siemen and Nicholas Rosato. *American Machinist*, v. 98, Aug. 30, 1954, p. 89-91.

Large cylinders of titanium alloy can be produced by trepanning from solid billets, salvaging the core from the hole by substituting rollers for wear plates, and changing the method of oil supply. Photographs. (G17, Ti)

508-G. Conventional Tools Machine Titanium. Roland Satterlee. *American Machinist*, v. 98, Aug. 30, 1954, p. 94-97.

Typical operations in producing an aircraft-gun part. Carbide tools, drilling and lathe operations. Photographs, diagrams. (G17, Ti)

509-G. Cope Talks on Draw Dies. XVIII. Fluid Dies Bulge Shells and Form Ornamental Designs. Stanley R. Cope. *American Machinist*, v. 98, Aug. 30, 1954, p. 109-112.

Design and operation of bulging dies. Diagrams. (To be continued.) (G14)

510-G. Milling Operations With Carbide Tipped Cutters. P. J. W. Cottrell. *Machinery (London)*, v. 85, Aug. 13, 1954, p. 339-346.

Tool angles, failures, economics and examples of various operations. Graphs, diagrams. (G17)

511-G. Hi-Jet System of Cutting Oil Application. *Machinery (London)*, v. 85, Aug. 20, 1954, p. 390-391.

Tool life improved when applied to turning steel. Diagram. (G21)

512-G. Metal Working Swings to Plastics Tools. *Modern Plastics*, v. 32, Sept. 1954, p. 85-95, 218-219.

Press forming and stretch forming with laminated plastic dies. Photographs. (G1, G9)

513-G. Mechanical Testing of Cutting Fluids. H. L. Bingham. *Scientific Lubrication*, v. 6, Aug. 1954, p. 22-24.

Tests for drilling and turning; difficulties involved. Graphs. (G21)

514-G. Practical Cutting Speed. It's Faster Than You Think. R. F. Huber. *Steel*, v. 135, Aug. 30, 1954, p. 64-66.

High cutting rates work out in production. Economics fix practical point in its application and potential. Photographs, table, graph, micrographs. (G17, ST)

515-G. Deep Draw Titanium in One Operation. *Steel*, v. 135, Aug. 30, 1954, p. 80.

New possibilities for design and use of titanium result from elimination of multiple draws. Photographs. (G4, Ti)

516-G. Tool Control for Multiple-Spindle Machines. Harry Conn. *Tool Engineer*, v. 33, Sept. 1954, p. 69-71.

Tooling factors for transfer and other types of multiple-spindle machines. Photographs, diagrams. (G17)

517-G. Cold Extrusion Primed for Mass Production. Ralph H. Eshelman. *Tool Engineer*, v. 33, Sept. 1954, p. 77-86.

Forward and backward extrusion, equipment, materials and future trends. Photographs, diagrams, graphs, tables. (G5)

518-G. (Dutch.) **Cutting.** *Metalen*, v. 9; *Handel en Industrie*, v. 9, no. 14, July 31, 1954, p. 125-128.

Cutting techniques and special features of Swiss machines. Photographs, diagrams. (To be continued.) (G17)

519-G. (French.) **Shot-Peening in the Machine Industry.** Alberto Oreffice. *Métallurgie et la construction mécanique*, v. 86, no. 4, Apr. 1954, p. 291, 293-294, 297.

Possibilities and use in production of springs and other parts. Photographs, tables, diagrams. (G23, ST)

520-G. (German.) **Bending Semifinished Products of Aluminum and Its Alloys.** *Aluminium Ranshofen, Mitteilungen*, v. 2, no. 1, June 1954, p. 7-13.

Methods of bending sheets, tubes and profiles. Diagrams, tables. (G6, Al)

521-G. (German.) **The Surface of Semifinished Aluminum Parts.** *Aluminium Ranshofen, Mitteilungen*, v. 2, no. 1, June 1954, p. 18-20.

Effect of mechanical, chemical and electrolytic machining methods on surface properties. (G17, L12, L13, Al)

522-G. (German.) **Band Grinding or Disk Grinding? IV.** G. Pahlitzsch and H. Windisch. *Metalloberfläche*, Ausgabe A, v. 8, no. 8, Aug. 1954, p. 119-125.

Experimental results on effects of different lubricants and coolants. Graphs. 8 ref. (G18, G21)

523-G. (Russian.) **Effect of Mechanical Properties of Metals on Occurrence of Vibrations During Machining.** B. G. Kelendzheridze *Stanki i Instrument*, v. 25, no. 7, July 1954, p. 15-16.

Effects of hardness, tensile strength, elongation and other properties on cutting speed. Graphs, table. 4 ref. (G17, Q29, Q23, ST, Al, Cu, CI)

524-G. (Russian.) **Means of Increasing Efficiency of Metals Finishing.** S. M. Kedrov. *Stanki i Instrument*, v. 25, no. 7, July 1954, p. 17-20.

Quantity and types of abrasives and lubricants. Lap materials and operations. Graphs, micrographs. (G18, CI, ST, Cu, Al)

525-G. (Russian.) **Influence of Machining Conditions on the Quality of Finish of the Surface of Chromium-Plated Parts During Polishing With Wheels.** A. A. Mikhailov. *Stanki i Instrument*, v. 25, no. 7, July 1954, p. 21-23.

Effect of grinding wheel type, feed and speed. Graphs, tables. 3 ref. (G18, ST, Cr)

526-G. (Book—French.) **Professional Technological Course.** v. III. 121 p. La Société de Publications Mécaniques, 15 rue Bleue, Paris 9e, France. 500 f. Post free 550 f.

Various types of machine tools and their applications. Basic information on machining processes. (G17)

H

Powder Metallurgy

123-H. Powder Metallurgy of Zirconium and Beryllium. H. H. Hausner and H. B. Michaelson. Paper from "Nuclear Engineering Pt. I.", American Institute of Chemical Engineers, p. 11-21.

Powder preparation, compacting, sintering, properties of sinterings. Graphs, tables, micrographs. 9 ref. (H10, H14, H15, H11, Be, Zr)

124-H. (French.) **Manufacture and Properties of S.A.P. Sintered Aluminum Powder.** *Journal du Four Electrique*, V. 63, no. 3, May-June 1954, p. 77-78.

Advantages of S.A.P. over aluminum alloys. (H11, Q general, Al)

125-H. (German.) **Preparation of Sintered Chromium-Nickel Steels.** F. Benesovsky and F. Moser. *Planseeberichte für Pulvermetallurgie*, v. 2, no. 1, June 1954, p. 20-23.

Description of procedure. Graph, tables. 7 ref. (H general, AY)

126-H. (Russian.) **Properties of Metalloceramic Materials Formed by Extrusion.** A. S. Fialkov and Ia. S. Umanskii. *Doklady Akademii Nauk SSSR*, v. 96, no. 6, June 21, 1954, p. 1213-1216.

Relation between flow properties and type of plasticizer. Effect of forming pressure on fired porosity. Table, graphs, diagram. 10 ref. (H11, Cu)

127-H. Now—Piston Rings From Powdered Iron. *Business Week*, 1954, no. 1303, Aug. 21, p. 90-92, 94.

Process, experimentation and pilot production and advantages. Photographs. (H general, Fe, T7)

128-H. Develop New Source for Electrolytic Iron Powder. R. N. Okuno and L. H. Mott. *Iron Age*, v. 174, Aug. 19, 1954, p. 132-133.

Converted byproduct from new pure electrolytic sheet iron process suitable for production of high-density, high-strength parts. Tables. (H10, Fe)

129-H. Effect of Powder Particle Size Upon Behavior of Sintered Iron in Nitriding. W. Köster and J. Raffelsieper. *Henry Brutcher, Altadena, Calif., Translation no.* 3093, 13 p. (From *Archiv für das Eisenhüttenwesen*, v. 23, nos. 5-6, 1952, p. 225-228.)

Previously abstracted from original. See item 88-H, 1952. (H15, Q29, R general, G17, Fe)

130-H. Some Properties of Iron Powders Produced by Atomization. V. I. Prosvirin and A. F. Silaev. *Henry Brutcher, Altadena, Calif., Translation no.* 3296, 7 p. (From *Vestnik Mashinostroeniya,* v. 33, no. 9, 1953, p. 59-61.)

Effects of atomizing iron powders for composition, particle size and tensile strength of sintered specimens. Tables, graphs, micrographs. (H10, H11, Q23, Fe)

131-H. (German.) **Silicides as Highly Heat Resistant Materials.** R. Kieffer, F. Benesovsky and C. Konopicky. *Berichte der deutschen keramischen Gesellschaft,* v. 31, no. 7, July 1954, p. 223-230.

History, preparation, properties and uses of silicides of the transition metals of groups IV to VI of the periodic table. Phase diagrams, tables, photographs, graphs. 34 ref. (H general)

132-H. (Russian.) **Antifriction Metal-Ceramic Material.** V. I. Likhtman. *Vestnik Akademii Nauk SSSR,* 1954, no. 7, July, p. 50-52.

Process of sintered porous iron-graphite bearings. (H15, Fe)

133-H. Particle Size Distribution Analyzed Quickly, Accurately. F. S. Eadie and R. E. Payne. *Iron Age,* v. 174, Sept. 2, 1954, p. 99-102.

New instrument determines distribution of particle sizes from 1 to 250 microns for use in powder metallurgy, ceramics, abrasives, powder cutting and air pollution control. Diagrams. (H11)

134-H. High Temperatures: Materials. Pol Duwez. *Scientific American,* v. 191, Sept. 1954, p. 98 + 5 pages.

Properties and applications of cermets. Photographs, diagram, micrographs. (H general)

135-H. (Russian.) **New Types of Electrical Ceramics.** N. P. Bogoroditskii, N. L. Poliakova, G. K. Kirillova and A. M. Eidel'kind. *Elektrichestvo,* 1954, no. 7, July, p. 56-60.

Dielectric and mechanical properties, structures and compositions and applications of metal-ceramic materials. Tables, photographs. (H general, P15, Q general, Al, Zr, Ti, Mg, Ba)

J
Heat Treatment

264-J. Some Practical Aspects of Induction Hardening. D. Warburton-Brown. *Machinery (London),* v. 85, July 23, 1954, p. 159-170.

Applications considered on basis of heat behavior, metallurgy and mechanical handling. Photographs, graphs, diagrams, tables. (J2)

265-J. Liquid Carburizing. Thomas M. Dougherty. *Metal Progress,* v. 66, Aug. 1954, p. 89-90.

Production of bearings increased 350% with half the manpower by changing from 21 batch-type pack carburizing furnaces to two salt furnaces for liquid carburizing. Photographs. (J28, J2, CN)

266-J. Improved Hardening Technique. Eduard M. H. Lips and H. Van Zuilen. *Metal Progress,* v. 66, Aug. 1954, p. 103-104.

Method involves formation of martensite on bainite from a deformed austenitic structure. Work is done at a heat below recrystallization temperature. Examples of results. (J26, CN, AY)

267-J. (French.) **Annealing of Thin Sheets.** J. Van Volsem. *Revue universelle des mines,* v. 10, ser, 9 no. 7, July 1954, 2 p.

Equipment and processes for hot and cold rolled steel. Photographs. (J23, ST)

268-J. (French.) **Analysis of Treatments in a Gaseous Atmosphere.** R. Boutigny. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 430-438.

Techniques of introducing conditioning gas into furnaces, characteristic compositions and practical applications. Graphs, tables. (J28, J2, Ni, Co, Zn, Cu, ST)

269-J. (French.) **Heat Treatments in Atmospheres With High Nitrogen Content.** J. Guingand. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 438-445.

Properties, production equipment and applications of atmospheres with $>90\%$ nitrogen. Graphs, tables, diagrams. (J2, ST)

270-J. (French.) **Controlled Cracked Ammonia-Base Atmospheres in Heat Treatment Furnaces. Mechanical and Electrical Construction of Furnaces.** Paul R. Duré. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 445-457.

Techniques and characteristics of atmospheres for treatment of various metals and alloys. Diagrams, tables, graphs. (J2, CI, ST, Ni, Cu, Mo, W, WC, Au, Ag)

271-J. (French.) **Generating Furnaces and Apparatuses for Gaseous Recarbonization, Cementation, and Carbo-Nitriding.** C. Demoulin. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 457-463.

Construction, types and operation of furnaces and gas generators. Diagrams, photograph. (J28, ST)

272-J. (French.) **Malleable Cast Iron. Recent Developments in Annealing Practice.** P. F. Hancock. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 463-472.

Gaseous annealing of white and blackheart malleable cast irons. Use of elevator-type furnaces. Photographs, diagrams, micrograph, graph. 9 ref. (J23, CI)

273-J. (French.) **Putting Isothermic Treatments Into Practice.** M. Stempfel. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 490-492.

Distinguishes between isothermic annealing, bainitic hardening of carbon steels and hardening of high speed steel. (J23, J26, CN, ST)

274-J. (French.) **Isothermic Tempering in Practice.** R. Mossoux and E. Progneaux. *Revue universelle des mines,* v. 10 ser. 9, no. 7, July 1954, p. 492-503.

Heat treatment of steam-turbine blades and parts of automatic light arms. Graphs, diagram, table. (J29, AY)

275-J. (French.) **Surface Treatments by High Frequency.** A. R. Baffrey. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 509-514.

Qualitative and quantitative analysis of laws controlling the surface heating of steel. Graphs, diagrams, photographs. 2 ref. (J2, ST)

276-J. (French.) **Equipment for Gaseous Carburizing.** J. A. Swain. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 514-530.

Processes of gaseous carburizing and cyaniding combined with tempering. Tables, photographs. (J28, ST)

277-J. (French.) **Modern Pit Furnaces for the Heat Treatment of Steels.** Hans Bühler. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 542-548.

Gas-heated furnaces for handling large parts. Diagrams, photographs. 7 ref. (J general, ST)

278-J. (German.) **Development and Status of Malleablizing and Tempering in Gas Atmospheres.** Hienrich Poetter. *Metallurgie und Giessereitechnik,* v. 4, no. 6, June 1954, p. 265-272.

Principal reactions in production of white and blackheart malleable iron in different atmospheres. Furnaces and furnace controls. Graphs, tables, diagrams, photograph. 25 ref. (J23, J29, CI)

279-J. Process Applications for Dual-Frequency Induction Heating. R. S. Segsworth. *Canadian Metals,* v. 17, Aug. 1954, p. 38, 40, 42, 44.

Factors affecting depth of penetration, costs. Uses for heat treating and melting. Diagram. 3 ref. (J2, C21, D6)

280-J. Tractor Shovels Need Tough Gears and Parts. R. H. Marshall. *Industrial Gas,* v. 33, Aug. 1954, p. 11-14, 20.

Use of high production, gas-fired batch furnaces to marquench and dry cyanide automotive parts. Photographs, diagram, tables. (J26, J28, ST)

281-J. Annealing Steel and Brass Shell Cases. W. M. Hepburn. *Industrial Heating,* v. 21, Aug. 1954, p. 1496 + 8 pages.

Furnaces, conveyors and other equipment. Photographs, tables, diagrams. (J23, CN, Cu)

282-J. Heat Transfer to Aluminum. IV. Kirtland Marsh. *Industrial Heating,* v. 21, Aug. 1954, p. 1510-1512, 1514.

Use of an exponential equation for calculating the size of a furnace for a given output of aluminum. Graph, table. (J general, Al)

283-J. On Heat Treated Parts. Dimensional Control System Cuts Finishing Costs. L. L. McArthur and E. H. Kinne. *Iron Age,* v. 174, Aug. 19, 1954, p. 121-124.

Master charts pinpoint exact amount of finishing stock needed to compensate for dimensional changes and distortion during heat treatment. Photographs, tables. (J general)

284-J. The Cassel Sulfinuz Process. *Machinery (London),* v. 85, Aug. 6, 1954, p. 291-293.

Sulfurizing process for carbon, alloy and toolsteels and cast iron. Increases resistance to wear and seizure and reduces coefficient of friction between treated surfaces. Tables. (J28, Q9, ST)

285-J. Mechanization and Application of Salt Bath Furnaces. Leon B. Rosseau. *Metal Treating,* v. 5, July-Aug. 1954, p. 2 + 5 pages.

Handling mechanisms. Applications of furnaces for hardening, carburizing, quenching, annealing, brazing and reheating. Photographs, diagrams. (J2, ST, EG-a)

286-J. Cost Accounting for Heat Treating. *Metal Treating,* v. 5, July-Aug. 1954, p. 4 + 8 pages.

Includes "Introduction", K. U. Jenks; "Determination of Expenses", Frederick C. Rimmele; and "Allocation of Expenses", Conrad H. Knerr. (To be continued.) (J general, A4)

287-J. A Work Horse for Industry —the Walking Beam Furnace. W. A. Darrah. *Metal Treating,* v. 5, July-Aug. 1954, p. 10-11.

Construction, heating by gas, oil or electricity and hearth loading. Photograph, diagrams. (J general)

288-J. Steel Supplier Has Modern Plant for Customer Service. Arthur Q. Smith. *Metal Treating,* v. 5, July-Aug. 1954, p. 12-13.

Warehouse heat treating facilities, including furnaces and inert gas generator. (J general, ST)

289-J. Controlled Agitation Advantageous in Hot Salt Quenching. R. F. Harvey. *Steel Processing,* v. 40, Aug. 1954, p. 519-524.

Equipment and techniques for optimum benefits of process. Diagrams, photographs, graphs. (J2, AY)

290-J. King Size Furnace Handles Water Shipped Assemblies. Harold F. Knab. *Western Metals,* v. 12, Aug. 1954, p. 52-53.

Features of giant heat treat furnace. Photographs. (J general)

291-J. Definitions of Heat Treating Processes. P. Riebensahm. *Henry Brutcher, Altadena, Calif., Translation no.* 3030, 15 p. (Condensed from *Haerterei-Technische Mitteilungen,* v. 4, 1949, p. 57-66.)

Basis for developing new heat treating practices and their application. Graphs. (J general, ST)

292-J. (French.) **Contribution to the Study of Secondary Hardening of Low-Alloy Ferrite Steels and Its Application to Creep.** Albert Portevin, André Constant and Georges Delbart. *Comptes rendus,* v. 239, no. 2, July 12, 1954, p. 138-141.

Heat treatment of vanadium ferritic steels with precipitation of fine vanadium carbides during creep resulting in better hot strength. Graphs, table. 5 ref. (J26, Q3, AY)

293-J. (German.) **Apparatus for the Generation of Protective Gases From Ammonia.** Ferdinand Brieger. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 448-452.

Simple apparatus generates protective gases by dissociating NH_3. Advantages and possible uses. Diagrams, tables, photographs, graph. (J2)

294-J. Induction Hardening Improves Gear Life, Shortens Heat Treating Cycle. W. L. Walz. *Iron Age,* v. 174, Aug. 26, 1954, p. 93-96.

Improved techniques result in better quality and lower processing costs. Diagrams, photograph. (J2, ST)

295-J. Heat-Treatment of High-Speed Steel. VIII. Annealing Treatment. S. G. Cope. *Metal Treatment and Drop Forging,* v. 21, Aug. 1954, p. 365-368.

Applications to cold and hot working operations. Details of other treatments. Graphs. 12 ref. (J23, J general, TS)

296-J. Salt Bath Heat Treating, Old Process With New Ideas. *Steel,* v. 135, Aug. 30, 1954, p. 68-71.

Versatility for heating and cooling metals provides wide range of uses. Isothermal method gives new properties to metals and holds down distortion. Photographs, graph. (J2)

K

Joining

580-K. Titanium Brazing. *Light Metal Age,* v. 12, Aug. 1954, p. 18 + 4 pages.

Torch, induction and resistance heating. Diagrams. (K8, Ti)

581-K. Increase Welding Speeds With Powdered Metal. L. K. Stringham. *Machine and Tool Blue Book,* v. 49, June 1954, p. 166-168, 170.

Advantages of using heavily coated electrodes containing large quantities of powdered metal. Table, photographs. (K1)

582-K. New Tin-Depositing Flux for Soldering Aluminum. Donald C. Burch and Robert L. Simpkins. *Materials & Methods,* v. 40, Aug. 1954, p. 86-89.

Stannous chloride base reaction flux used with zinc-tin or zinc-aluminum alloys meets most requirements for successful soldered joints. Photographs, tables. (K7, Al)

583-K. The Metallurgy of Welding. W. I. Pumphrey. *Metallurgia,* v. 50, no. 297, July 1954, p. 3-9.

Metallurgical changes during welding, their effect on properties of the weld metal and the heat affected zone of the parent metal. Micrographs, tables. 5 ref. (K9)

584-K. Dry Hydrogen Brazing for High Strength Alloys. Floyd C. Kelley. *Product Engineering,* v. 25, Aug. 1954, p. 156-160.

Method and advantages of process applied to high-strength alloys. Photographs, diagrams, table, micrograph. (K8)

585-K. The Welding of Monel and K-Monel. F. A. Ball. *Sheet Metal Industries,* v. 31, no. 328, Aug. 1954, p. 685-689.

Resistance and flash welding methods. Tables, micrographs, photographs. 3 ref. (K3, Ni-d)

586-K. The Welding of Magnesium Base Alloys. Lester F. Spencer. *Sheet Metal Worker,* v. 45, Aug. 1954, p. 82-84, 86, 118.

Gas shielded-arc and resistance methods. Tables. (K1, K3, Mg)

587-K. Fasteners. Design for Specials Becomes Standard. William R. Wolfe. *Steel,* v. 135, Aug. 16, 1954, p. 96-98.

Advantages of multifunction fasteners designed for a special application. Examples. Photographs, diagrams. (K13)

588-K. (French.) **The Repair of Grey Cast Iron Castings in Great Britain.** A. B. Everest and F. A. Ball. *Fonderie,* 1954, no. 102, July, p. 4031-4039.

Economic and other factors affecting repair practices. Welding methods. Photographs. (K general, CI)

589-K. (French.) **Recent Developments in the Welded Construction of Electrical Equipment.** M. Sherrington. *Revue de la Soudure (Brussels),* v. 10, no. 2, 1954, p. 71-78.

Welding of hydraulic presses, transformers, alternators, safety shields, etc. Photographs. (K general)

590-K. (French.) **News of the International Welding Institute; Report of Committee 1. Gas Welding.** C. G. Keel. *Revue de la Soudure (Brussels),* v. 10, no. 2, 1954, p. 86-87.

Classification of deposited metals and selection of a weld test method. Tables. (K2)

591-K. (French.) **News of the International Welding Institute. Tests, Measurements and Controls of Welds.** Georges A. Homes. *Revue de la Soudure (Brussels),* v. 10, no. 2, 1954, p. 88-93.

Radiography, weld classification, ultrasonics, radioisotopes. Table. (K9)

592-K. (French.) **New Practical Test Method for Checking Quality of Spot Welds on Low-Alloy Semihard Steel.** P. Joumat. *Revue de la Soudure (Brussels),* v. 10, no. 2, 1954, p. 100-104.

Torsion-shear method of investigating welds. Photographs, micrographs. (K9, K3, AY)

593-K. (German.) **Electric-Arc Welding in Shipbuilding.** G. Jung. *Elektrotechnische Zeitschrift,* v. 6, Ausgabe B, no. 7, July 1954, p. 225-230.

Types of electric-arc welding used in shipbuilding and electrical equipment. Photographs, graphs, diagrams, tables. 2 ref. (K1, ST)

594-K. Now Titanium Can Be Furnace-Brazed. R. A. Long. *American Machinist,* v. 98, Aug. 16, 1954, p. 117-119.

Development of brazing filler alloy and low-temperature brazing. Photograph, diagrams, micrograph. (K8, Ti)

595-K. Soldering Aluminium. A Survey of Progress. J. C. Bailey and J. A. Hirschfield. *Research,* v. 7, Aug. 1954, p. 320-326.

Methods, solders and properties of joints. Tables, photograph. 6 ref. (K7, Al)

596-K. Welding Procedure for Welding Tubes in Heat Exchangers. W. E. Battles. *Welding Journal,* v. 33, Aug. 1954, p. 739-742.

Experimental assembly set-up for development of suitable procedures and specifications for fabricating tubular heat exchangers. Photographs. (K general, CN)

597-K. High Production Application of Resistance Welding. C. D. Shultheis. *Welding Journal,* v. 33, Aug. 1954, p. 768-777.

Steadily increased use of resistance welding as a production tool and its impact on the high production of ranges, dryers, etc. Diagrams, photographs, graph. (K3)

598-K. Welding Aluminum Sheet. F. C. Geibig. *Welding Journal,* v. 33, Aug. 1954, p. 784-788.

Designed to help welding operators who have infrequent occasion to weld aluminum by the oxy-acetylene process. Diagrams, photographs. (K2, Al)

599-K. Powdered Iron Invades Electrode Designs. L. K. Stringham. *Welding Journal,* v. 33, Aug. 1954, p. 788-789.

Efficient use of arc heat by powdered metal coatings means lower welding costs through higher welding speeds, lower cleaning costs because of less spatter and undercut and smoother and more uniform welds. Photographs, table. (K1)

600-K. Submerged Arc Welding of Chromium-Bearing Steels. Clarence E. Jackson and Arthur E. Shrubsall. *Welding Journal,* v. 33, Aug. 1954, p. 752-758.

Influence of current, voltage and speed of travel on weld area and recovery of chromium, silicon, nickel, manganese and other alloys. Tables, graphs, photograph. 5 ref. (K1, AY)

601-K. Spot Welding Thin Aluminum. I. W. Johnson. *Welding Journal,* v. 33, Aug. 1954, p. 759-762.

Slope control with single-phase equipment provides means of simulating wave shape of stored energy discharge necessary for welding thin aluminum alloy sheets. Tables, photographs, graph. (K3, Al)

602-K. The Welding of Heavy Sections. W. Spraragen and M. A. Cordovi. *Welding Journal,* v. 33, Aug. 1954, p. 369S-386S.

Preheating, peening, intermediate stress-relieving, special electrodes and techniques are devices successfully used to facilitate welding heavy sections. Tables, diagrams, photographs, macrographs. 18 ref. (K1, G23, J1, ST)

603-K. Designing and Making Welded Structural Steel Members for Cyclic Loading. *Welding Journal,* v. 33, Aug. 1954, p. 386S-387S.

Precautions to be used in designing and making structures which are subjected to cyclic loading. (K general, T26)

604-K. The Spot Welding of Titanium. E. R. Funk. *Welding Journal,* v. 33, Aug. 1954, p. 397S-400S.

Mechanical properties of titanium spot welds using different settings and thicknesses of material. Graphs, tables, photograph. 2 ref. (K3, Q general, Ti)

605-K. Effects of Oxygen and Nitrogen in Welding Titanium Alloys. James H. Johnston. *Welding Journal,* v. 33, Aug. 1954, p. 414S-416S.

Maximum tolerable oxygen and nitrogen contamination levels in welds in various alloys of titanium as determined through simulated welds in these alloys. Graphs, table, photograph. 3 ref. (K1, Ti)

606-K. Weldments in the Titanium-Manganese Sheet Alloy RC-130A. H. M. Meyer. *Welding Journal,* v. 33, Aug. 1954, p. 417S-421S.

Influence of heat treatment in overcoming embrittlement in weldments in commercial titanium sheet alloy containing 6.5 to 8% manganese and effects of surface contamination. Graphs, tables, micrographs. (K general, Q23, Ti)

607-K. 30-Ft Diameter All-Welded Test Tank. John Vasta and Frank W. Dunham. *Welding Journal,* v. 33, Aug. 1954, p. 422S-432S.

Design and construction and comparison of theoretical solutions to some of the problems. Experimental test data taken during proof testing. Diagrams, graphs, photograph. (K9, ST)

608-K. Sigma Welding of Carbon Steels. T. L. McElrath and R. T. Telford. *Western Machinery and Steel World,* v. 45, Aug. 1954, p. 97-100.

Applications and process limitations. Filler rod development. Tables, diagrams, graph. (K1, CN)

609-K. Submerged Automatic Arc Welding With Several Electrodes Simultaneously. V. S. Volodin. *Henry Brutcher, Altadena, Calif., Translation no.* 3016, 3 p. (From *Avtogennoe Delo,* v. 24, no. 2, 1953, p. 25-26.)

Submerged automatic welding process using two or more electrodes simultaneously. Tables, photographs. (K1, CN)

610-K. (Japanese.) Quality Control of Spot Welding of Light Alloys. B. Nakamura. *Metals (Japanese),* v. 24, no. 7, July 1954, p. 578-581.

Equipment, tests, welders' records and operations control. Photographs, charts. (K3, S12, Al)

611-K. Ceramic-to-Metal Seals for Vacuum Tubes. Thomas L. Evans. *Ceramic Age,* v. 64, sec. 1, Aug. 1954, p. 9-13; disc., p. 13-14.

Requirements and methods. Photographs, diagrams. (K11)

612-K. Welding Copper and Copper Alloy Castings. A. O. Dodge. *Foundry,* v. 82, Sept. 1954, p. 165, 168-170.

Techniques for applying cast-weld construction to aluminum bronze castings. Photographs. (K general, Cu)

613-K. New Automatic Welding Procedures at Navy's Mare Island Shipyard. *Industry & Welding,* v. 27, Sept. 1954, p. 35-37.

Typical applications in construction of submarines. Photographs. (K1, ST)

614-K. High Temperature Brazing Alloys. George D. Cremer, Frank J. Fillipi and Richard S. Mueller. *Industry & Welding,* v. 27, Sept. 1954, p. 40-42, 97.

Properties and applications of various alloys. Photographs. (K8)

615-K. Resistance Welding Eliminates Parts, Speeds Production at Delco-Remy. J. Raymond Wirt. *Industry & Welding,* v. 27, Sept. 1954, p. 52-54.

Advantages of welding over soldering or riveting. Photographs. (K3)

616-K. 21 Ways to Lower Cost of Arc Welding for Production. Robert Wilson. *Industry & Welding,* v. 27, Sept. 1954, p. 58-62, 64-65.

Design, material selection, welding techniques and finishing operations. Diagrams, photograph. (K1)

617-K. Metallic-Arc Welding of Spheroidal-Graphite Cast Iron. F. A. Ball and D. R. Thorneycroft. *Institute of British Foundrymen, Paper no.* 1095, 1954, 16 p.

Mechanical properties of joints using nickel-iron and aluminum bronze electrodes. Analysis of structures of weld metal and adjacent cast iron. Tables, photographs, micrographs, graphs, diagrams. 7 ref. (K1, M27, Q general, CI)

618-K. Welding Without Prebeveling Lowers Fabricating Costs. R. C. Hermon. *Iron Age,* v. 174, Aug. 26, 1954, p. 104-105.

Arcair gouging of square butted joints. Photographs. (K general, G22)

619-K. Welding Aluminium-Alloy Structures. J. E. Tomlinson. *Light Metals,* v. 17, Aug. 1954, p. 250-253.

Recent progress and present practice in arc welding methods. Table, photographs, graph. 9 ref. (K1, Al)

620-K. Compressed Glass-to-Metal Seals. H. Adam. *Society of Glass Technology, Journal,* v. 38, no. 182, June 1954, p. 285T-296T.

Theoretical and practical concepts regarding compression factor. Diagrams, graphs, photographs. 8 ref. (K11)

621-K. Pushbutton Welding. A Step Closer. R. W. Tuthill. *Steel,* v. 135, Aug. 30, 1954, p. 76-77.

New developments in consumable-electrode gas-shielded welding step up speeds while reducing costs and need for operator skill. Graphs, photographs. (K1)

622-K. Automatic Welding of Long Seams. *Tool Engineer,* v. 33, Sept. 1954, p. 74-76.

Equipment and methods in building railroad cars. Photographs. (K1)

623-K. Ultrasonic Fluxless Soldering Technique. Glenna S. McWhirter. *Welding Engineer,* v. 39, Sept. 1954, p. 26-27.

Process and advantages. Photographs. (K7, Al, Cu, Ag, Mg)

624-K. (French.) Submerged Arc Welding in the Boiler Industry. Luigi Rivoira and Franco Rivoira. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 319, 321.

Welding of water tanks and bottles for liquid gas. (K1, ST)

625-K. (French.) Butt-Welding Machines for Large-Size Sheets. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 323-325.

Arc-welding machine which incorporates equipment for removal of excess weld metal. Photographs. (K1, ST)

626-K. (German and French.) **Repairing a Fire Box.** H. Siegenthaler. *Zeitschrift für Schweisstechnik,* v. 44, no. 8, Aug. 1954, p. 173-175.

Procedure of weld repairing a locomotive fire box. Photographs. (K general, CN)

627-K. (German and French.) **Welding Sheet Aluman Without Distortion or Cracking.** H. Siegenthaler. *Zeitschrift für Schweisstechnik,* v. 44, no. 8, Aug. 1954, p. 175-177.

Techniques for fabrication and repair. Photographs. (K general, Al)

628-K. (German.) **Blind Riveting in Light-Metal Construction.** Leo Kirste. *Aluminium Ranshofen, Mitteilungen,* v. 2, no. 1, June 1954, p. 13-15.

Methods of riveting. Diagrams. (K13)

629-K. (German.) **Butt Weld or Ball Joint in Pipeline Construction?** Hans Geilenkeuser. *Gas und Wasserfach,* v. 95, Ausgabe Gas, no. 15, Aug. 1, 1954, p. 479-481.

Relative merits of two types of pipe connections on basis of calculations and practical experience. Diagrams. (K1, K13)

630-K. (German.) **Modern Binders and the Gluing of Metals.** *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 23, Aug. 11, 1954, p. 777.

Adhesive properties of several synthetic compounds on resin base. 1 ref. (K12)

631-K. (Swedish.) **Good Old Vintage.** *Svetsaren,* v. 19, no. 1, 1954, p. 1-5.

Welding repairs carried out on various old English water pumping machinery. Types of electrodes and fatigue tests on weldments. Photographs, diagram. (K1, Q7)

632-K. (Swedish.) **Söderströmsbron, an All-Welded Railroad Bridge of St 44.** *Svetsaren,* v. 19, no. 1, 1954, p. 6-13.

Design, tests of material and welding alloys and construction techniques. Diagrams, tables, photographs. (K general, T26, CN)

633-K. (Swedish.) **New Hard Welding Alloy With High Resistance to Wear.** Tore Noren and Torvald Hellerstrom. *Svetsaren,* v. 19, no. 1, 1954, p. 14-20.

Development and application of OK H 13 silicon-chromium base electrodes. Micrographs, photographs, table, graph. 9 ref. (K1, L24, Si, Cr, AY)

634-K. (Book.) **Annual Report for 1953-54.** 48 p. The British Welding Research Association, 29 Park Crescent, London W. 1., England.

Concise account of the Association's activities. List of confidential reports which have been issued to members. Research notes. (K general)

L

Cleaning, Coating and Finishing

736-L. Corrosion Resistant Finishes. Arno J. Liebman. *American Paint Journal,* v. 38, Aug. 9, 1954, p. 26 + 6 pages.

Baked coatings, coatings in the form of linings metallizing under organic coating systems, care along weld-seams, coatings in hidden areas. 21 ref. (L26, L23)

737-L. Industrial Finishes. C. G. Moore. *American Paint Journal,* v. 38, Aug. 9, 1954, p. 77 + 10 pages.

Crystallizing, hammer, wrinkle and spatter finishes; crackle lacquers. 32 ref. (L26)

738-L. Chromium Diffusion as a Commercial Process. R. L. Samuel and N. A. Lockington. *Industrial Finishing (London),* v. 6, July 1954, p. 896 + 10 pages.

Process and results obtained. Graphs, diagrams, tables. 12 ref. (L15, Cr)

739-L. The Future of Electroplating. William Blum. *Institute of Metal Finishing, Bulletin,* v. 4, Summer 1954, p. 107-120; disc., p. 121-126.

Predictions covering next 25 yr. (L17)

740-L. Some Aspects of Tinning by Immersion Processes. D. E. Weimer and J. W. Price. *Institute of Metal Finishing, Bulletin,* v. 4, Summer 1954, p. 163-176.

Contact process and tinning of aluminum alloys by simple immersion. Tables, graphs. 7 ref. (L16, Al, Sn)

741-L. Studies on Metallizing of Non-Metals. I. Nickel Sulphate-Pyridine Bath. K. Chakraborty and T. Banerjee. *Journal of Scientific & Industrial Research,* v. 13, sec. B, June 1954, p. 433-440.

Influence of various factors on nickel microfilms formed on glass by reduction of nickel sulfate with sodium hydrosulphite in presence of pyridine. Tables, graphs. 23 ref. (L14, Ni)

742-L. Anti-Corrosion Advances in Light Metals. Emo D. Porro. *Light Metal Age,* v. 12, Aug. 1954, p. 12-13, 29.

Metallic plating, organic and inorganic coatings. Cathodic protection. (L general, R10, Al, Mg)

743-L. Adherence of Paint Films. E. G. Bobalek. *Metal Progress,* v. 66. Aug. 1954, p. 113-119.

Effect of pigments, thinners and application conditions. Photographs, micrographs, diagrams. (L26)

744-L. Electrocladding of Reactor Materials. John G. Beach and Charles L. Faust. Paper from "Nuclear Engineering. Pt. I". American Institute of Chemical Engineers, p. 31-38.

Electrocladding of aluminum, beryllium, magnesium and zirconium. Surface preparation, activation treatments. Photographs, tables, micrographs. 12 ref. (L22, Al, Be, Mg, Zr)

745-L. (English.) **Chromizing of Spheroidal Graphite Cast Iron.** Shigetomo Ueda. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 39-41.

Chromium chloride process. Wear tests of chromized surface. Micrograph, diagram, graph. 2 ref. (L15, Q9, Cr, CI)

746-L. (French.) **Influence of Withdrawal Rate on the Thickness of Zinc Coatings.** A. Gordet. *Métallurgie et la construction mécanique,* v. 86, nos. 7-8, July-Aug. 1954, p. 593, 595.

Proper selection of withdrawal rate is very important in obtaining uniform galvanizing. (L16, CN, Zn)

747-L. (French.) **Notes on the Gaseous Chromizing of Steel.** Paul R. Duré. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 531-541.

Review of techniques, equipment and applications. Micrographs, diagrams, tables. (L15, ST, Cr)

748-L. (German.) **Dust Dangers in Metal Enamel Manufacturing.** K. Meures. *Staub,* 1954, no. 36, p. 260-263.

Dangers to health (silicosis) and to cleanliness of product. Means of countering dangers. (L27, A7)

749-L. (Hungarian.) **Electrochemical Investigation of Corrosion-Inhibitive Phosphate Coatings. II. The Effect of Aftertreatment in Hot and Cold Phosphatizing.** Klara Kovacs. *Magyar Kémikusok Lapja,* v. 9, no. 7, July 1954, p. 210-213.

Interpretation of studies on breakdown potential of various phosphate treatments. Graphs, tables. 4 ref. (L14, R11)

750-L. Aluminized Coatings. A. G. Thomson. *Aircraft Engineering,* v. 26, Aug. 1954, p. 226.

Comparison of hot dip coating with aluminum and hot galvanizing. Corrosion resistance, mechanical properties and costs. (L16, R general, Q general, Al, Zn)

751-L. Hard Chrome Plate Pays Unexpected Dividends. Walter White and Martin McKean. *American Machinist,* v. 98, Aug. 16, 1954, p. 142-143.

Advantages of plating tools and gages. Salvage of castings by using plating to build up overmachined surfaces. Photographs. (L17, Cr)

752-L. Thick Insulating Ceramic Coatings for Metal. *Ceramics,* v. 6, July 1954, p. 207-217.

Compositions, application by dipping or ramming. Properties. Tables, diagram, graphs. (L27)

753-L. Flame Spraying Increases Versatility of Refractory Coatings. Frank Charity. *Consulting Engineer,* v. 4, Aug. 1954, p. 36-37.

Types of coatings and application procedures. Photographs, table. (L27)

754-L. Scumming of Enamels. Final Report of Sub-Committee of the Institute of Vitreous Enamellers. *Foundry Trade Journal,* v. 97, Aug. 5, 1954, p. 153-158.

Summaries of research literature on scumming covering the associated industries of ceramics and glass. Graph, tables. (L27)

755-L. Metal Cleaning and Its Improvement by the Use of Ultrasonics. T. J. Kearney. *Institute of Radio Engineers, Transactions of the I.R.E. Professional Group on Ultrasonics Engineering, PGUE-*1, June 1954, p. 43-47.

History and development of process. Transducers producing ultrasonic waves. Production equipments. Photographs. (L10)

756-L. Phosphorized Anodes Produce Smoother, Heavier Copper Plate. R. P. Nevers, R. L. Hungerford and E. W. Palmer. *Iron Age,* v. 174, Aug. 12, 1954, p. 114-116.

Copper electrodes containing at least 0.005% phosphorus or arsenic give better results than high-purity electrodes. Micrograph, table, photographs. 3 ref. (L17, Cu)

757-L. Improvement of the Corrosion Resistance of Tinplate by a Chemical Treatment. S. C. Britton and R. M. Angles. *Journal of Applied Chemistry,* v. 4, July 1954, p. 351-364.

Treatment in sodium chromate-sodium hydroxide solution found practical for food cans. Photographs, graphs, table. 5 ref. (L14, Sn)

758-L. The Mechanism of the Corrosion-Inhibitive Action of Paints, With Special Reference to Basic Pigments. J. E. O. Mayne and D. van Rooyen. *Journal of Applied Chemistry,* v. 4, July 1954, p. 384-394.

Use of a basic pigment modifies anodic reaction. Studies of the linoleates of lead, zinc, calcium, barium and strontium. Tables, graphs, diagram. 27 ref. (L26, R10)

759-L. Applications of Dewatering Fluids. R. H. Warring. *Machinery Lloyd (Overseas Ed.),* v. 26, July 31, 1954, p. 62-67.

Theory, properties, types, application methods and advantages in finishing operations. Diagrams. (L12)

760-L. Finishing in the Heart of Industrial Europe. Joan T. Wiarda and Marvin Rubinstein. *Metal Finishing,* v. 52, Aug. 1954, p. 51-64.

Technical study of electroplating shops in Belgium, England, France, West Germany, Italy, the Netherlands and Switzerland. Photographs, tables. (L17)

761-L. Commercial Aspects of European Finishing. Joan Wiarda and Marvin Rubinstein. *Metal Finishing,* v. 52, Aug. 1954, p. 65-66.

Factors such as war damage and national confinement on electroplating facilities. Photographs. (L17)

762-L. Plating in the Automotive Industry: Its History and Development. William M. Phillips. *Metal Finishing,* v. 52, Aug. 1954, p. 73-77.

Advent of auto grilles, stainless steel, bright plating and World War II. Photographs. (To be concluded.) (L17)

763-L. Surface Treatment and Finishing of Light Metals. IV. Chemical Cleaning and Pre-Treatment Processes. S. Wernick and R. Pinner. *Metal Finishing,* v. 52, Aug. 1954, p. 78-82, 97.

Cleanliness tests and cleaning methods for various requirements. (To be continued.) (L12)

764-L. Asphalt Roofing Aluminum Paint and Its Effect on Leafing. Raymond H. Frederick and W. P. Woosley. *Paint and Varnish Production,* v. 44, Aug. 1954, p. 28-33.

Effects of vehicle components. Tables, graphs. (L26, Al)

765-L. Thermal Radiations and Surface Coatings. K. Magnusson. *Paint Manufacture,* v. 24, Aug. 1954, p. 255-257.

Reports on absorptivity and reflectivity of several coatings, especially with aluminum pigments. Photographs, tables. 3 ref. (L26, Al)

766-L. Fighting Corrosion, Erosion, and Reducing Metal Temperatures in Vessels and Lines With Monolithic Linings. Walter A. Bradbury. *Petroleum Engineer,* v. 26, Aug. 1954, p. C57 + 5 pages.

At high temperatures monolithic linings have given good service in hydrocarbon-catalyst media for three years; in catalyst service these linings have stood up for six years. Graphs, photographs, diagrams, table. (L26, CN)

767-L. Evaporated Multiple Layers With Semiconductor Properties. J. C. M. Brentano and J. D. Richards. *Physical Review,* v. 95, ser. 2, Aug. 1, 1954, p. 841-843.

Alternate deposition of iron and lead on Pyrex in high vacuum. Analysis of conductance with time and temperature. Graphs. 4 ref. (L25, P15, Fe, Pb)

768-L. A Study of Leveling in Acid Copper Baths. Fred I. Nobel and Barnet D. Ostrow. *Plating,* v. 41, Aug. 1954, p. 892-899; disc., p. 899-900.

Evaluation of factors and addition agents. Graphs. 6 ref. (L17, Cu)

769-L. A Study of Leveling in Cyanide Copper Baths. Barnet D. Ostrow and Fred I. Nobel. *Plating,* v. 41, Aug. 1954, p. 885-891; disc., p. 899-900.

Surface evaluation; effects of free potassium cyanide, current density, agitation, carbonate build-up, and tartrate on leveling action and proprietary addition agents. Photograph, graphs. 8 ref. (L17, Cu)

770-L. Industrial Applications for Metallized Nonconductors. Harold Narcus. *Plating,* v. 41, Aug. 1954, p. 901-902, 907-913; disc., p. 913-914.

Electronics, slush molds, spray masks and medicine. Photographs, tables. 9 ref. (L general)

771-L. Finishes for Aluminum. II. Chemical & Electrochemical Finishing. R. Vanden Berg. *Screw Machine Engineering,* v. 15, Aug. 1954, p. 41-47.

Bright dip, frosted finish, chemical oxide and phosphate coatings, anodic oxidation and electroplating. Photographs, table, diagram. (L general, Al)

772-L. The Effect of Welding Variables on Hard-Facing Deposits. A. Zvanut and V. Peters. *Welding Journal,* v. 33, Aug. 1954, p. 778-782.

Hard facing deposits are affected by welding variables which determine deposit analysis and cooling rate of the deposit. Tables, graphs. (L24)

773-L. Right Metal in the Right Place. George H. Thurston. *Western*

Machinery and Steel World, v. 45, Aug. 1954, p. 86-90.

Characteristics and application of hard surfacing materials. Diagrams. (L24)

774-L. Anodic Oxidation of Metals With Different Surface Textures. G. S. Vozdvizhenskii, A. Sh. Valeev and T. N. Grechukhina. *Henry Brutcher, Altadena, Calif., Translation no.* 3055, 6 p. (From *Doklady Akademii Nauk SSSR*, v. 72, no. 2, 1950, p. 311-313.)

Previously abstracted from the original. See item 504-L, 1950. (L19, Al)

775-L. Hot Tinning Problems. G. I. Chufarov, M. G. Zhuravleva, E. P. Tatievskaya, B. D. Averbukh and V. K. Antonov. *Henry Brutcher, Altadena, Calif., Translation no.* 3262, 8 p. (From *Zhurnal Prikladnoi Khimii*, v. 25, 1953, p. 652-655.)

Previously abstracted from original. See item 51-L, 1954. (L16, Zn, Sn)

776-L. Descaling by Reducing the Scale With Sodium Hydride. A. V. Smirnov, S. A. Semenkovich and F. A. Bogachev. *Henry Brutcher, Altadena, Calif., Translation no.* 3307, 9 p. (From *Vestnik Mashinostroeniya*, v. 33, no. 3, 1953, p. 37-39.)

Advantages of reducing scale with sodium hydride compared with three other descaling processes. Table, diagram. 3 ref. (L12, ST)

777-L. Gas Chromizing of Steel Using Ceramic Materials. G. N. Dubinin. *Henry Brutcher, Altadena, Calif., Translation no.* 3316, 6 p. (From *Vestnik Mashinostroeniya*, v. 33, no. 12, 1953, p. 69-70.)

Use of porous ceramics saturated with chromium chloride to produce a steady supply of chromium. Equipment and techniques. Table, diagrams, micrograph. 7 ref. (L15, Cr, ST)

778-L. Investigation of Some Slushing Oils Capable of Protecting Steel Parts From Corrosion During Processing and Storage. V. V. Skorcheletti and V. E. Piskorskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3317, 9 p. (From *Zhurnal Prikladnoi Khimii*, v. 27, no. 3, 1954, p. 314-318.)

Previously abstracted from original. See item 502-L, 1954. (L26, ST)

779-L. Regeneration of Electropolishing Solutions for Steel. N. P. Fedot'ev, E. G. Kruglova and S. Ya. Grilikhes. *Henry Brutcher, Altadena, Calif., Translation no.* 3334, 14 p. (From *Zhurnal Prikladnoi Khimii*, v. 27, no. 2, 1954, p. 157-165.)

Previously abstracted from original. See item 475-L, 1954. (L13, ST)

780-L. (French.) **O.N.E.R.A. Processes of Thermal Chromizing and the Heat-Treatment of Chromized Steels.** Ph. Galmiche. *Revue de métallurgie*, v. 51, no. 7, July 1954, p. 489-497.

Influence of the quality of steels treated and conditions of treatment on the quality of protection conferred by thermal chromizing. Photographs, tables, micrographs. (L15, J general, ST)

781-L. (French.) **"Integrated Chromizing": Combination of a Simple Heat Treatment With a Thermochemical Chromium Cementation Treatment.** Ph. Galmiche. *Revue de métallurgie*, v. 51, no. 7, July 1954, p. 498-501; disc., p. 501-502.

Examples of cases where a metal surface-diffusion treatment, chromizing in particular, can be combined with an ordinary heat treatment process. Micrographs, diagrams, tables. (L15, J general, Fe, Cr)

782-L. (German.) **Prolonging the Service Life of Drill Bars.** Hermann v. Braunmühl. *Zeitschrift für Erzbergbau und Metallhüttenwesen*, v. 7, no. 7, July 1954, p. 289-290.

Hard facing of drill bits resulted in tripled service life. Photographs. (L24)

783-L. (German.) **Contribution to the Behavior of Freshly Vapor-Deposited Metal Films.** H. Gobrecht. *Zeitschrift für Physik*, v. 138, nos. 3-4, 1954, p. 345-352.

Measurements with a needle counter indicate that the fading of electron emission depends on rate of deposition and surface density. Diagram, graphs, micrographs. 5 ref. (L25, P10, Sb, Pb)

784-L. Tin-Nickel Alloy Plating. A New Decorative and Protecting Coating. *Automobile Engineers*, v. 44, Aug. 1954, p. 320-322.

Equipment, anodes, process operation and control. (L17, Ni, Sn)

785-L. Removing Metal by Chemistry to Produce Difficult Shapes for Aircraft Structures. Manuel C. Sanz. *Automotive Industries*, v. 111, Sept. 1, 1954, p. 54-57, 112, 114.

Chemical milling by controlled etching of aluminum. Photographs, diagrams. (L12, Al)

786-L. Ceramic Coatings for Use in Nuclear Reactors. *Ceramic Age*, v. 64, sec. 1, Aug. 1954, p. 40-42.

Boron-free coatings having very low thermal neutron absorption coefficients. Tables, micrographs. 9 ref. (L27)

787-L. Radiometric Study of Phosphate Coatings Formed on Steel in Pretreatment Baths. Thomas F. Boyd, Michael Galan and Leonard Markowitz. *Corrosion*, v. 10, Sept. 1954, p. 285-288.

No correlation found between amount of coating and degree of protection using various treatments. Tables. 2 ref. (L14, CN)

788-L. Machine Methods Make Strip Transmission Line. K. S. Packard. *Electronics*, v. 27, Sept. 1954, p. 148-150.

Copper-clad dielectrics permit fabrication of microwave components. Diagrams, photographs, graph. 2 ref. (L22, T1, Cu)

789-L. An Introduction to the Electrodeposition of Aluminium. A. W. Castle. *Electroplating and Metal Finishing*, v. 7, Aug. 1954, p. 291-294, 305.

Difficulties, and attempts to overcome them. Use of fused baths and organic electrolytes. Photographs, micrograph, diagram, table. 34 ref. (L17, Al)

790-L. The History of Electrolytic and Chemical Polishing. R. Pinner. *Electroplating and Metal Finishing*, v. 7, Aug. 1954, p. 295-298.

Origin and development. 11 ref. (L13, L12)

791-L. Investigations Into the Metal-Spraying Process. A. Matting and K. Becker. *Engineers' Digest*, v. 15, Aug. 1954, p. 309-314. (From *Schweissen und Schneiden*, v. 6, no. 4, Apr. 1954, p. 127-142.)

Previously abstracted from original. See item 517-L, 1954. (L23)

792-L. Bimetallic Castings. Achieved by Bonding Process. Vincent Delport. *Foundry*, v. 82, Sept. 1954, p. 102 + 5 pages.

Techniques of producing aluminum castings with steel or cast iron inserts. Micrograph, photographs. (L22, Al, CI)

793-L. Controlled Air Conditioning in Metal Finishing. *Industrial Finishing (London)*, v. 7, Aug. 1954, p. 31-32, 34, 36.

Advantages and equipment for cleaning air and controlling humidity. Diagrams. 6 ref. (L general, A7)

794-L. Descaling and Pickling Titanium. Thomas A. Dickinson. *Industrial Finishing (London)*, v. 7, Aug. 1954, p. 43-44.

Precautions and processes for various conditions. Photographs. (L10, L12, Ti)

795-L. New Developments Teamed Up to Make High-Quality, Low-Cost Hard Surfacing Deposits. L. K. Stringham. *Iron Age*, v. 174, Sept. 2, 1954, p. 103-105.

Feeding two carbon steel electrodes through a submerged-arc welding head plus alloying ingredient in flux simultaneously permits high rate of deposition. Photographs. (L24, AY)

796-L. Test Gives Bond Life Expectancy of Bimetallic Materials. J. B. Mohler. *Iron Age*, v. 174, Sept. 2, 1954, p. 106-107.

Measurements of bond strength after heating gives progress of bond deterioration. Successful results on aluminum on steel bearings. Table, graph, diagram. 3 ref. (L22, ST, Al)

797-L. HAE Coating Variations. Harry A. Evangelides. *Magnesium*, 1954, Aug., p. 5-6.

Properties of coating for magnesium. Graph, photographs. (L14, Mg)

798-L. Metal Cleaning. K. G. Lewis. *Metal Treatment and Drop Forging*, v. 21, Aug. 1954, p. 377-386.

Mechanical methods. Evaluation of peening and liquid honing. Photographs, micrographs, diagrams. 27 ref. (L10, G19, G23)

799-L. Oxidation Resistance of Diffusion Coatings on Sintered and Swaged Molybdenum Wire. C. J. Leadbeater and D. T. Richards. *Metal Treatment and Drop Forging*, v. 21, Aug. 1954, p. 387-396.

Factors influencing protection of wire at high temperatures. Graphs, tables, micrographs. 1 ref. (L15, R2, Mo)

800-L. Bi-Metallic Casting Cuts Weight. *Metal-Working*, v. 10, Sept. 1954, p. 10-11.

Fer-Mag process of bonding cast magnesium to steel. Photograph, micrograph. (L22, Mg, ST)

801-L. Protection of Steel. II. Primer Coats. Martin E. Schleicher. *Paint Industry Magazine*, v. 69, Aug. 1954, p. 21-23.

Special functions of primer coats, selection of vehicles and pigments. Table, diagram. (L26, ST)

802-L. Coating Wire Products With Plastics. *Plastics*, v. 19, Aug. 1954, p. 261-262.

Progress in dip coating wire products with polythene and polyvinyl chloride. Photographs. (L26)

803-L. Organic Finishes on Electroplate Coatings With Special Reference to Adhesion. E. C. J. Marsh. (Condensation of *Institute of Metal Finishing, Transactions, Advance Copy no.* 22, 1954.) *Products Finishing*, v. 18, Sept. 1954, p. 24 + 17 pages.

Uses and advantages of dual coatings to satisfy service requirements of electrical communications equipment. Photographs, tables. (L26)

804-L. How Norris Ordnance Puts Protective Coatings on Steel Cartridge Cases. C. E. Fisher and D. F. Zlatnik. *Products Finishing*, v. 18, Sept. 1954, p. 110 + 12 pages.

Zinc plating process and installation. Photographs, diagram. (L16, L17, ST, Zn)

805-L. Disposal of Electroplating Wastes by Oneida, Ltd. III. Plant Design. Charles A. Walker, Barnett F. Dodge and John Madden. **IV. Treatment of Lagoon Waters.** Charles A. Walker, Paul W. Eichenlaub and James Cox. *Sewage and Industrial Wastes*, v. 26, Aug. 1954, p. 1002-1013.

Equipment and operating proced-

ures for acid and alkali wastes. Flowsheet, plant layout, tables. (L17, A8)

806-L. Flame-Plating Process. Increased Service Life for Metal Parts. *Steel*, v. 135, Aug. 30, 1954, p. 67.

Wear problems solved by coatings of tungsten carbide deposited on surfaces of parts and tools. Photographs. (L24, W)

807-L. (French.) **Shot-Blasting by Monorail Tunnel Machines.** Guy Guidicelli. *Métallurgie et la construction mécanique*, v. 2, no. 1, June 1954, p. 299-301.

Equipment and operating procedures. Photographs. (L10, ST)

808-L. (French.) **Research on Galvanizing Cooking Utensils.** A. Gordet. *Métallurgie et la construction mécanique*, v. 86, no. 4, Apr. 1954, p. 337, 339.

Loss in weight during cleaning operations. Tables. (L16, CN, Zn)

809-L. (German.) **Cleaning and Care of Aluminum.** *Aluminium Ranshofen, Mitteilungen*, v. 2, no. 1, June 1954, p. 3-6.

Cleaning agents. Methods of cleaning and protecting surfaces. Photographs. 1 ref. (L12, Al)

810-L. (German.) **Technical Applications of High-Vacuum Vaporization.** W. Köhler. *Metall*, v. 8, nos. 15-16, Aug. 1954, p. 618-624.

Vapor deposition techniques and applications for numerous metals. Diagram, graphs, photographs, table. 19 ref. (L25)

811-L. (German.) **Precipitating Hard Lustrous Silver Deposits.** L. Bosdorf and A. Beyer. *Metalloberfläche*, Ausgabe B, v. 6, no. 8, Aug. 1954, p. 113-116.

Literature review on electroplating. Micrographs, photographs, graph. 13 ref. (L17, Ag)

812-L. (German.) **Metallizing Nonconductors.** F. Elser. *Metalloberfläche*, Ausgabe A, v. 8, no. 8, Aug. 1954, p. 126-127.

Fusion, vapor deposition, spraying and electroplating on nonmetallic base materials. 8 ref. (L general)

813-L. (Italian.) **Possibility of Increasing the Protective Power of Anodic Oxide Films on Aluminum.** G. P. Bolognesi. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 44-45; disc., p. 45.

Salts are adsorbed in the aluminum by maintaining the anodized piece for a period of time in a concentrated solution of the salts. 6 ref. (L19, Al)

814-L. (Italian.) **Examining Materials Offered by Modern Technology to Combat Corrosion.** P. Negretto. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 51-53; disc., p. 53.

Investigates acid-proof varnishes, enamels, gum, ebonite, thermoplastic resins, sandstone and graphite products. (L26)

815-L. (Italian.) **Anticorrosive Protection by Means of Phosphating.** P. De Cerna. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 67.

Advantages of phosphating in the anticorrosive protection of iron. (L14, Fe)

816-L. (Italian.) **Use of Inhibitors in the Pickling of Castings.** B. Domenicali. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 68; disc., p. 68.

Action of oxides and silica removal. (L12, CI)

817-L. (Italian.) **Some Research on Accelerators and Inhibitors in Cleaning and Cold Phosphating.** L. Felloni. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 70-72.

Investigates weight loss of specimens in nine different inhibiting solutions, and mechanism of the action of eight substances commonly used as phosphating accelerators. Tables, graphs. 7 ref. (L12, L14, ST)

818-L. (Italian.) **Adsorption and Overvoltage in the Action of Pickling Inhibitors.** A Indelli and G. P. Bolognesi. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 73-74.

Survey of current thought and research. 17 ref. (L12, ST)

819-L. (Italian.) **Practical Marginal Considerations on the Theory of Anticorrosive Protection of Industrial Manufactured Articles.** F. Schieroni. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 77, 95.

Use of varnishes to stop corrosion on large industrial equipment already in advanced stages of corrosion. (L26, ST)

820-L. (Italian.) **Use of Tin in Protection Against Corrosion.** S. C. Britton. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 89-90.

Factors that determine protective qualities of various types of tin-base coatings. (L16, L17, Sn)

821-L. (Italian.) **Refractory Ceramic Coating for the Protection of Materials at High Temperature.** E. Crepaz. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 113-116; disc., p. 116.

Characteristics, composition and application of enamels. Tables, charts. 16 ref. (L27, SS, CN)

822-L. (Russian.) **Problem of Kinetics in Electrolytic Deposition of Nickel.** S. V. Gorbachev and Iu. N. Iurkevich. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 6, June 1954, p. 1120-1128 + 1 plate.

Polarization and current density during electrolysis of solutions of nickel chloride in water. Polarization and temperature, and X-ray diffraction studies. Graphs, micrographs. 11 ref. (L17, P13, M22, Ni)

823-L. (Book.) **Phosphating—I. Principles and Practice.** 69 p. 1953. Imperial Chemical Industries Ltd., London, S.W.1., England.

Report of a conference organized by the I.C.I. Ltd., in Birmingham, in Jan. 1953. (L14)

824-L. (Photocopy.) **Sulphurization, or Sulphur Cementation.** U. S. Department of the Navy, Bureau of Ships Translation no. 538. Report no. PB113742. 6 p. 1952. Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm or photostat $1.50.

Process of producing wear resisting surfaces on cast iron and steel. (L15, CI, ST)

825-L. (Book—German.) **(Handbook of Grinding.) Handbuch Des Schleifens.** P. Feldmann. 160 p. 1954. Verlag W. Girardet, Essen, Germany. DM 14.80.

Purposes; applications; methods. Grinding wheels and abrasives. (G18)

826-L. (Book—German.) **(Modern Grinding and Polishing Practice.) Neuzeitliche Schleif- und Polierpraxis.** W. Burkart. 176 p. 1954. Eugen S. Leuze Verlag, Saulgau, Wittenberg, Germany. DM. 12.25.

Polishing of light metals, glass, precious stones and ivory. Polishing compositions. Reflectivity testing. Degreasing. Barrel polishing. (L10, L12)

M

Metallography, Constitution and Primary Structures

318-M. An Fe-Cr-Mo-Ni Sigma Phase. A. G. Allten. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Aug. 1954, p. 904-905.

Metallographic and X-ray diffraction examination verifies existence of sigma phase. Tables, diffraction pattern. 3 ref. (M26)

319-M. Locations and Sizes of Interstitial Holes in the Alpha-Uranium Lattice. A. J. Opinsky. *Journal of Metals*, v. 6, Aug. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Aug. 1954, p. 913-914.

Theoretical and mathematical approach in orthorhombic uranium lattice, based on a hard-sphere model. Photographs, tables. 1 ref. (M26, U)

320-M. Columbium-Vanadium Alloy System. H. A. Wilhelm, O. N. Carlson and J. M. Dickinson. *Journal of Metals*, Aug. 1954, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Aug. 1954, p. 915-918.

Proposed phase diagram based on microscopic studies, melting points and X-ray analyses. Micrographs, table, graphs. 7 ref. (M24, Cb, V)

321-M. Thermodynamic Data for the Zinc-Indium System Obtained From the Phase Diagram. W. J. Svirbely. *Journal of Physical Chemistry*, v. 58, July 1954, p. 557-559.

Solubility data at 700° K. Graphs. 9 ref. (M24, Zn, In)

322-M. A Method for the Electrolytic Etching of Aluminium for Microscopic Examination. P. A. Raine, H. J. Ellis, and L. W. Terry. *Metallurgia*, v. 50, no. 297, July 1954, p. 45-46, 52.

Experimental details for improved method for development and control of structure of extruded aluminum tube. Micrographs, diagram, photograph. 1 ref. (M21, Al)

323-M. High-Resolution Autoradiography. George C. Towe, Henry J. Gomberg and J. W. Freeman. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3209, July 1954, 138 p.

Adaptation of high-resolution wet-process autoradiographic method to the study of metal structures. Graphs, autoradiographs, micrographs, diagrams, tables. 101 ref. (M23)

324-M. (English.) **Effect of Oxides on the Structure of Gray Cast Iron.** Nobutaro Kayama. *Castings Research Laboratory, Report, Waseda University*, 1954, no. 5, p. 14-18.

Effects of nonmetallic inclusions on graphitization and stability of carbides. Diagram, table, graphs, micrographs. (M26, CI)

325-M. (English.) **Studies on the Determination of Non-Metallic Inclusions in Iron and Steel. I. Determination of Non-Metallic Inclusions in Plain Carbon Steel and Silicon Steel.** Hidehiro Goto and Toshio Watanabe. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 5, no. 6, Dec. 1953, p. 505-512.

Comparison of methods for analysis of inclusions. Diagram, tables. 11 ref. (M28, CN, AY)

326-M. (English.) Critical Potentials of Soft X-Rays and of Secondary Electrons From Copper and Their Physical Significances. Mitsuru Sato. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 5, no. 6, Dec. 1953, p. 533-553.

Experimental values explained as dissociation potentials of chain molecules of copper atoms. Graphs, tables. 15 ref. (M25, P10, Cu)

327-M. (French.) Theory of Diffusion of X-Rays Through Crystals. I. J. Laval. *Journal de physique et le radium,* v. 15, nos. 7-9, July-Sept. 1954, p. 545-558.

Comparison of classic and Brillouin analyses. (M22)

328-M. (French.) Grain Size Measurement in Metals and Alloys. Eugene Dupuy. *Métaux, Corrosion-Industries,* v. 29, no. 346, June 1954, p. 225-241.

Planimetric, counting, comparison and stereoradiographic methods. Diagrams, micrographs, tables, graphs. 20 ref. (M27, M23, ST)

329-M. (German.) Low-Temperature X-Ray Investigations of Vapor-Deposited Tin Films. Wilhelm Rühl. *Zeitschrift für Physik,* v. 138, no. 2, 1954, p. 121-135.

Structures at temperatures from 20 to 290° K. for tin and coppertin alloys. Diagrams, X-ray patterns, graphs. 8 ref. (M26, L25, Sn, Cu)

330-M. (German.) Electron Diffraction Patterns of Thin Metallic Layers at Low Temperatures. Werner Buckel. *Zeitschrift für Physik,* v. 138, no. 2, 1954, p. 136-150.

Structures of tin, tin-copper, tingallium and tin-bismuth films. Diagram, graphs, diffraction patterns. 20 ref. (M22, Sn, Cu, Ga, Bi)

331-M. (Russian.) Problem of Structure of Carbide Phases of Vanadium. M. A. Gurevich and B. F. Ormont. *Doklady Akademii Nauk SSSR,* v. 96, no. 6, June 21, 1954, p. 1165-1168.

Synthesis, analysis and structure of phases in the low-oxygen range of the vanadium-oxygen-carbon system. Tables, graphs. 17 ref. (M26, V)

332-M. The Germanium-Oxygen System. Michael Hoch and Herrick L. Johnston. *Journal of Chemical Physics,* v. 22, Aug. 1954, p. 1376-1377.

X-ray diffraction patterns for germanium plus germanium oxide (GeO_2) from 750 to 1400° C. X-ray patterns, table, graphs. 4 ref. (M22, M24, Ge)

333-M. The Structure of Electrodeposits. II. J. J. Dale. *Metal Finishing,* v. 52, Aug. 1954, p. 67-72.

Effect of basis metal, dirt and inclusions, defects on structure. Micrographs, photograph. 35 ref. (M27, Cu, Pb, Cr, Ni)

334-M. Periodic Impurities in a Periodic Lattice. Edward H. Kerner. *Physical Review,* v. 95, ser. 2, Aug. 1, 1954, p. 687-689.

The eigenvalue problem for a periodic linear chain of arbitrary square-well A and B atoms of an arbitrary concentration. Diagram. 4 ref. (M26)

335-M. Neutron Optics and Neutron Diffraction. II. Applications. G. E. Bacon. *Research,* v. 7, Aug. 1954, p. 312-319.

Determination of nuclear constants and investigations of structure of solids. Table, diagrams, graphs. 25 ref. (M22)

336-M. The Constitution of the Copper-Rich Copper-Aluminium-Tin Alloys, With Special Reference to Ternary Compound Formation. J. S. L. Leach and G. V. Raynor. *Royal Society, Proceedings,* v. 224, ser. A, June 22, 1954, p. 251-259.

Examination by metallographic and X-ray methods at temperatures below the eutectoid decomposition in copper-aluminum system. Graphs, diagrams. 4 ref. (M24, Cu, Al, Sn)

337-M. The Electronic Structure of the Borides *M*B$_6$. H. C. Longuet-Higgins and M. de V. Roberts. *Royal Society, Proceedings,* v. 224, ser. A, July 7, 1954, p. 336-347.

Interpretation of structure, stability and electrical properties of metallic borides. Diagrams, tables, graphs. 10 ref. (M25, M26, P15, B)

338-M. The Metallographic View. I. Annealed Carbon Steels. Howard E. Boyer. *Steel Processing,* v. 40, Aug. 1954, p. 505, 526.

Appearance and significance of typical microstructures. Micrographs, graph. (M27, CN)

339-M. Alloys of Titanium With Copper, Silver, and Gold. E. Raub, P. Walter and M. Engel. *Henry Brutcher, Altadena, Calif., Translation no.* 3017, 16 p. (From *Zeitschrift für Metallkunde,* v. 43, no. 4, 1952, p. 112-118.)

Previously abstracted from original. See item 256-M, 1952. (M24, Cu, Ag, Au, Ti)

340-M. Preparation of Metallographic Sections and Development of Microstructure of Cemented Carbides. I. N. Chaporova. *Henry Brutcher, Altadena, Calif., Translation no.* 3061, 12 p. (From *Zavodskaya Laboratoriya,* v. 15, no. 7, 1949, p. 799-805.)

Compositions and evaluation of various etchants. Table, micrographs. (M21, M27, C-n)

341-M. X-Ray Investigations of Titanium Nitride and Titanium Carbide Surface Layers. A. Münster and K. Sagel. *Henry Brutcher, Altadena, Calif., Translation no.* 3250, 21 p. (From *Zeitschrift für Elektrochemie,* v. 57, no. 7, 1953, p. 571-579.)

Composition of surface layers on iron and molybdenum studied by X-rays. Tables, graphs, drawings, radiographs. 22 ref. (M26, Fe, Mo)

342-M. A New Method for Polishing and Etching of Metallographic Specimens of Tungsten and Molybdenum Metal. T. Millner and L. Sass. *Henry Brutcher, Altadena, Calif., Translation no.* 3281, 5 p. (From *Aluminium (Budapest),* v. 5, no. 10, Oct. 1953, p. 214-215.)

Previously abstracted from original. See item 68-M, 1954. (M21, W, Mo)

343-M. Superheating of a Solid in Vacuo. D. S. Kamenetskaya and I. B. Piletskaya. *Henry Brutcher, Altadena, Calif., Translation no.* 3319, 6 p. (From *Doklady Akademii Nauk SSSR,* v. 94, no. 4, 1954, p. 689-691.)

Previously abstracted from original. See item 215-M, 1954. (M24, Mg, Zn, Cd, Mn, Al)

344-M. (English.) X-Ray Measurements of Local Atomic Arrangements in Aluminum-Zinc and in Aluminum-Silver Solid Solutions. P. S. Rudman and B. L. Averbach. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 576-582.

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346-M. (French.) Possibilities of Quantitative Autoradiography by Means of Microphotometric Measurements. A. Kohn. *Revue de métallurgie,* v. 51, no. 7, July 1954, p. 503-513.

Problems arising in the quantitative autoradiographic study of dendritic segregation in steels. Description of microphotometer. Experimental results obtained in the course of the homogenization of phosphorus segregation. Diagrams, autoradiograph, photograph, table, graphs. 4 ref. (M23, ST)

347-M. (German.) Plane Lattice Effects in Electron Diffraction Investigations on Different Metal Films. Heribert Jahrreiss. *Annale der Physik,* v. 14, nos. 6-8, 1954, p. 319-340.

Experimental study on vapor deposited nickel, silver and gold films to explain anomalous lines occasionally observed on electron-diffraction pictures. Diagrams, tables. 21 ref. (M22, L25, Ni, Ag, Au)

348-M. (German.) The Palladium-Manganese Alloys. Ernst Raub and Werner Mahler. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 430-436.

Determination of constitution diagram, phase structures and lattice constants by micrographic and X-ray sudies at normal and elevated temperatures. Constitution diagram, micrographs, tables, graphs. 9 ref. (M24, M26, Mn, Pd)

349-M. (German.) A Simple Rapid Method of Determining Lattice Constants to ± 0.00005 KX by Means of a Counting Tube Goniometer. Fritz Ebert. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 436-439.

Method and apparatus. Studies on gamma iron. Photographs, graph. (M23, Fe)

350-M. (German.) Development and Results of High-Temperature Metal Microscopy. Gerhard Reinacher. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 453-458.

Review of literature and description of different devices. Diagrams, photographs. 33 ref. (M21)

351-M. (German.) X-Ray Determination of Electron Distribution in Aluminum. H. Bensch, H. Witte and E. Wölfel. *Zeitschrift für physikalische Chemie (Frankfurt),* v. 1, nos. 3-4, May 1954, p. 256-258.

Single-crystal and powder techniques at room temperature. Table, diagram. (M25, Al)

352-M. Etch Pits and Dislocations in Germanium and Silicon. J. J. Oberly. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1025-1026.

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353-M. Method of Using a Fine-Focus X-Ray Tube for Examining the Surface of Single Crystals. L. G. Schulz. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1082-1083.

Techniques for obtaining X-ray micrographs. Diagrams, micrographs. 3 ref. (M21)

354-M. Correlation of Polarized Light Phenomena With the Orientation of Some Metal Crystals. C. J. Newton and H. C. Vacher. *Journal of Research, National Bureau of Standards,* v. 53, July 1954, p. 1-12.

Reflection of plane polarized light upon specimens of tin, aluminum

ures for acid and alkali wastes. Flowsheet, plant layout, tables. (L17, A8)

806-L. Flame-Plating Process. Increased Service Life for Metal Parts. *Steel*, v. 135, Aug. 30, 1954, p. 67.

Wear problems solved by coatings of tungsten carbide deposited on surfaces of parts and tools. Photographs. (L24, W)

807-L. (French.) **Shot-Blasting by Monorail Tunnel Machines.** Guy Guidicelli. *Métallurgie et la construction mécanique*, v. 2, no. 1, June 1954, p. 299-301.

Equipment and operating procedures. Photographs. (L10, ST)

808-L. (French.) **Research on Galvanizing Cooking Utensils.** A. Gordet. *Métallurgie et la construction mécanique*, v. 86, no. 4, Apr. 1954, p. 337, 339.

Loss in weight during cleaning operations. Tables. (L16, CN, Zn)

809-L. (German.) **Cleaning and Care of Aluminum.** *Aluminium Ranshofen, Mitteilungen*, v. 2, no. 1, June 1954, p. 3-6.

Cleaning agents. Methods of cleaning and protecting surfaces. Photographs. 1 ref. (L12, Al)

810-L. (German.) **Technical Applications of High-Vacuum Vaporization.** W. Köhler. *Metall*, v. 8, nos. 15-16, Aug. 1954, p. 618-624.

Vapor deposition techniques and applications for numerous metals. Diagram, graphs, photographs, table. 19 ref. (L25)

811-L. (German.) **Precipitating Hard Lustrous Silver Deposits.** L. Bosdorf and A. Beyer. *Metalloberfläche*, Ausgabe B, v. 6, no. 8, Aug. 1954, p. 113-116.

Literature review on electroplating. Micrographs, photographs, graph. 13 ref. (L17, Ag)

812-L. (German.) **Metallizing Nonconductors.** F. Elser. *Metalloberfläche*, Ausgabe A, v. 8, no. 8, Aug. 1954, p. 126-127.

Fusion, vapor deposition, spraying and electroplating on nonmetallic base materials. 8 ref. (L general)

813-L. (Italian.) **Possibility of Increasing the Protective Power of Anodic Oxide Films on Aluminum.** G. P. Bolognesi. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 44-45; disc., p. 45.

Salts are adsorbed in the aluminum by maintaining the anodized piece for a period of time in a concentrated solution of the salts. 6 ref. (L19, Al)

814-L. (Italian.) **Examining Materials Offered by Modern Technology to Combat Corrosion.** P. Negretto. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 51-53; disc., p. 53.

Investigates acid-proof varnishes, enamels, gum, ebonite, thermoplastic resins, sandstone and graphite products. (L26)

815-L. (Italian.) **Anticorrosive Protection by Means of Phosphating.** P. De Cerna. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 67.

Advantages of phosphating in the anticorrosive protection of iron. (L14, Fe)

816-L. (Italian.) **Use of Inhibitors in the Pickling of Castings.** B. Domenicali. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 68; disc., p. 68.

Action of oxides and silica removal. (L12, CI)

817-L. (Italian.) **Some Research on Accelerators and Inhibitors in Cleaning and Cold Phosphating.** L. Felloni. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 70-72.

Investigates weight loss of specimens in nine different inhibiting solutions, and mechanism of the action of eight substances commonly used as phosphating accelerators. Tables, graphs. 7 ref. (L12, L14, ST)

818-L. (Italian.) **Adsorption and Overvoltage in the Action of Pickling Inhibitors.** A Indelli and G. P. Bolognesi. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 73-74.

Survey of current thought and research. 17 ref. (L12, ST)

819-L. (Italian.) **Practical Marginal Considerations on the Theory of Anticorrosive Protection of Industrial Manufactured Articles.** F. Schieroni. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 77, 95.

Use of varnishes to stop corrosion on large industrial equipment already in advanced stages of corrosion. (L26, ST)

820-L. (Italian.) **Use of Tin in Protection Against Corrosion.** S. C. Britton. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 89-90.

Factors that determine protective qualities of various types of tin-base coatings. (L16, L17, Sn)

821-L. (Italian.) **Refractory Ceramic Coating for the Protection of Materials at High Temperature.** E. Crepaz. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 113-116; disc., p. 116.

Characteristics, composition and application of enamels. Tables, charts. 16 ref. (L27, SS, CN)

822-L. (Russian.) **Problem of Kinetics in Electrolytic Deposition of Nickel.** S. V. Gorbachev and Iu. N. Iurkevich. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 6, June 1954, p. 1120-1128 + 1 plate.

Polarization and current density during electrolysis of solutions of nickel chloride in water. Polarization and temperature, and X-ray diffraction studies. Graphs, micrographs. 11 ref. (L17, P13, M22, Ni)

823-L. (Book.) **Phosphating—I. Principles and Practice.** 69 p. 1953. Imperial Chemical Industries Ltd., London, S.W.1., England.

Report of a conference organized by the I.C.I. Ltd., in Birmingham, in Jan. 1953. (L14)

824-L. (Photocopy.) **Sulphurization, or Sulphur Cementation.** U. S. Department of the Navy, Bureau of Ships Translation no. 538. Report no. PB113742. 6 p. 1952. Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm or photostat $1.50.

Process of producing wear resisting surfaces on cast iron and steel. (L15, CI, ST)

825-L. (Book—German.) **(Handbook of Grinding.) Handbuch Des Schleifens.** P. Feldmann. 160 p. 1954. Verlag W. Girardet, Essen, Germany. DM 14.80.

Purposes; applications; methods. Grinding wheels and abrasives. (G18)

826-L. (Book—German.) **(Modern Grinding and Polishing Practice.) Neuzeitliche Schleif- und Polierpraxis.** W. Burkart. 176 p. 1954. Eugen S. Leuze Verlag, Saulgau, Wittenberg, Germany. DM. 12.25.

Polishing of light metals, glass, precious stones and ivory. Polishing compositions. Reflectivity testing. Degreasing. Barrel polishing. (L10, L12)

M

Metallography, Constitution and Primary Structures

318-M. An Fe-Cr-Mo-Ni Sigma Phase. A. G. Allten. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Aug. 1954, p. 904-905.

Metallographic and X-ray diffraction examination verifies existence of sigma phase. Tables, diffraction pattern. 3 ref. (M26)

319-M. Locations and Sizes of Interstitial Holes in the Alpha-Uranium Lattice. A. J. Opinsky. *Journal of Metals*, v. 6, Aug. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Aug. 1954, p. 913-914.

Theoretical and mathematical approach in orthorhombic uranium lattice, based on a hard-sphere model. Photographs, tables. 1 ref. (M26, U)

320-M. Columbium-Vanadium Alloy System. H. A. Wilhelm, O. N. Carlson and J. M. Dickinson. *Journal of Metals*, Aug. 1954, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Aug. 1954, p. 915-918.

Proposed phase diagram based on microscopic studies, melting points and X-ray analyses. Micrographs, table, graphs. 7 ref. (M24, Cb, V)

321-M. Thermodynamic Data for the Zinc-Indium System Obtained From the Phase Diagram. W. J. Svirbely. *Journal of Physical Chemistry*, v. 58, July 1954, p. 557-559.

Solubility data at 700° K. Graphs. 9 ref. (M24, Zn, In)

322-M. A Method for the Electrolytic Etching of Aluminium for Microscopic Examination. P. A. Raine, H. J. Ellis, and L. W. Terry. *Metallurgia*, v. 50, no. 297, July 1954, p. 45-46, 52.

Experimental details for improved method for development and control of structure of extruded aluminum tube. Micrographs, diagram, photograph. 1 ref. (M21, Al)

323-M. High-Resolution Autoradiography. George C. Towe, Henry J. Gomberg and J. W. Freeman. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3209, July 1954, 138 p.

Adaptation of high-resolution wet-process autoradiographic method to the study of metal structures. Graphs, autoradiographs, micrographs, diagrams, tables. 101 ref. (M23)

324-M. (English.) **Effect of Oxides on the Structure of Gray Cast Iron.** Nobutaro Kayama. *Castings Research Laboratory, Report, Waseda University*, 1954, no. 5, p. 14-18.

Effects of nonmetallic inclusions on graphitization and stability of carbides. Diagram, table, graphs, micrographs. (M26, CI)

325-M. (English.) **Studies on the Determination of Non-Metallic Inclusions in Iron and Steel. I. Determination of Non-Metallic Inclusions in Plain Carbon Steel and Silicon Steel.** Hidehiro Goto and Toshio Watanabe. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 5, no. 6, Dec. 1953, p. 505-512.

Comparison of methods for analysis of inclusions. Diagram, tables. 11 ref. (M28, CN, AY)

326-M. (English.) Critical Potentials of Soft X-Rays and of Secondary Electrons From Copper and Their Physical Significances. Mitsuru Sato. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 5, no. 6, Dec. 1953, p. 533-553.

Experimental values explained as dissociation potentials of chain molecules of copper atoms. Graphs, tables. 15 ref. (M25, P10, Cu)

327-M. (French.) Theory of Diffusion of X-Rays Through Crystals. I. J. Laval. *Journal de physique et le radium*, v. 15, nos. 7-9, July-Sept. 1954, p. 545-558.

Comparison of classic and Brillouin analyses. (M22)

328-M. (French.) Grain Size Measurement in Metals and Alloys. Eugene Dupuy. *Métaux, Corrosion-Industries*, v. 29, no. 346, June 1954, p. 225-241.

Planimetric, counting, comparison and stereoradiographic methods. Diagrams, micrographs, tables, graphs. 20 ref. (M27, M23, ST)

329-M. (German.) Low-Temperature X-Ray Investigations of Vapor-Deposited Tin Films. Wilhelm Rühl. *Zeitschrift für Physik*, v. 138, no. 2, 1954, p. 121-135.

Structures at temperatures from 20 to 290° K. for tin and copper-tin alloys. Diagrams, X-ray patterns, graphs. 8 ref. (M26, L25, Sn, Cu)

330-M. (German.) Electron Diffraction Patterns of Thin Metallic Layers at Low Temperatures. Werner Buckel. *Zeitschrift für Physik*, v. 138, no. 2, 1954, p. 136-150.

Structures of tin, tin-copper, tin-gallium and tin-bismuth films. Diagram, graphs, diffraction patterns. 20 ref. (M22, Sn, Cu, Ga, Bi)

331-M. (Russian.) Problem of Structure of Carbide Phases of Vanadium. M. A. Gurevich and B. F. Ormont. *Doklady Akademii Nauk SSSR*, v. 96, no. 6, June 21, 1954, p. 1165-1168.

Synthesis, analysis and structure of phases in the low-oxygen range of the vanadium-oxygen-carbon system. Tables, graphs. 17 ref. (M26, V)

332-M. The Germanium-Oxygen System. Michael Hoch and Herrick L. Johnston. *Journal of Chemical Physics*, v. 22, Aug. 1954, p. 1376-1377.

X-ray diffraction patterns for germanium plus germanium oxide (GeO_2) from 750 to 1400° C. X-ray patterns, table, graphs. 4 ref. (M22, M24, Ge)

333-M. The Structure of Electrodeposits. II. J. J. Dale. *Metal Finishing*, v. 52, Aug. 1954, p. 67-72.

Effect of basis metal, dirt and inclusions, defects on structure. Micrographs, photograph. 35 ref. (M27, Cu, Pb, Cr, Ni)

334-M. Periodic Impurities in a Periodic Lattice. Edward H. Kerner. *Physical Review*, v. 95, ser. 2, Aug. 1, 1954, p. 687-689.

The eigenvalue problem for a periodic linear chain of arbitrary square-well A and B atoms of an arbitrary concentration. Diagram. 4 ref. (M26)

335-M. Neutron Optics and Neutron Diffraction. II. Applications. G. E. Bacon. *Research*, v. 7, Aug. 1954, p. 312-319.

Determination of nuclear constants and investigations of structure of solids. Table, diagrams, graphs. 25 ref. (M22)

336-M. The Constitution of the Copper-Rich Copper-Aluminium-Tin Alloys, With Special Reference to Ternary Compound Formation. J. S. L. Leach and G. V. Raynor. *Royal Society, Proceedings*, v. 224, ser. A, June 22, 1954, p. 251-259.

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and Monel with various surface treatments. Polarization figures, micrographs, graphs, tables, diagrams. 20 ref. (M21, Al, Sn, Ni-d)

355-M. A Simple Anodizing Process for Revealing the Grain Structure of Aluminum Alloys. H. G. Cole and W. J. D. Brooks. *Metallurgia,* v. 50, no. 298, Aug. 1954, p. 97-100.

Techniques and applications for various alloys. Micrographs, tables. 6 ref. (M27, M23, Al)

356-M. Austenitic Grain Size Measurement of Steels. A. Kohn. *Metal Treatment and Drop Forging,* v. 21, Aug. 1954, p. 359-364.

Review and comparison of methods. New French technique of a modified oxidation method. Micrographs. 10 ref. (M27, ST)

357-M. (German.) **Investigation on Magnesium-Titanium Ternary Systems.** H. Eisenreich, Nachrodt and H. Pütter. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 624-625.

Solubility of titanium in magnesium and effects of zinc, aluminum, silicon, iron, copper and manganese additions. Tables. (M24, Mg, Ti)

358-M. (German.) **A Heatable Back-Reflection X-Ray Camera for Monocrystals.** Joachim Teltow. *Zeitschrift für angewandte Physik,* v. 6, no. 6, June 1954, p. 280-282.

Equipment determines exact lattice constants to near melting point of monocrystals. Drawings. 5 ref. (M26, M22)

359-M. (Russian.) **X-Ray Structural Study of Solid Solutions of (Ba,Pb) TiO_3.** E. G. Fesenko and A. G. Slabchenko. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1288-1290.

Includes graphs. 3 ref. (M26, Ba, Pb)

N

Transformations and Resulting Structures

337-N. Annealing of Cold Worked Metals. Paul A. Beck. *Advances in Physics,* v. 3, July 1954, p. 245-324 + 11 plates.

Mechanisms explaining well-annealed condition approached by recovery, subgrain growth and recrystallization. Graphs, tables, diagram. 187 ref. (N4, N5, J23)

338-N. Solubility of Hydrogen in Iron-Carbon Alloys. B. G. Davies and T. Evans. *Foundry Trade Journal,* v. 97, July 29, 1954, p. 115-122.

Equilibrium value of solubility of alloys with up to 3.4% carbon from 600 to 1000° C. at one atmosphere pressure. Diagrams, tables, graphs. 4 ref. (N12, Fe)

339-N. (English.) **The Transformation of the Steels by the Rapid Heating. IV. On the A_c Transformation of the Armco Iron.** Kiyoshi Yokota and Nobuhiro Iguchi. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 44-47.

Determination of mechanism of the transformation by analysis of time-dilatometric curves for rapid rates of heating. Photograph, diagram, graphs. 11 ref. (N8, Fe)

340-N. (English.) **Formation Energy of Superlattice in Ni_3Fe. II. Kinetics of the Superlattice in the Stage of Local Ordering.** Shuichi Iida. *Physical Society of Japan, Journal,* v. 9, no. 3, May-June 1954, p. 346-354.

Change of internal energy of Ni_3Fe superlattice during cooling processes studied by specific heat measurement for various rates of cooling. Graphs. 15 ref. (N10, Ni, Fe)

341-N. (English.) **X-Ray Study of Cold Work in Some Ordered Alloys.** Shoichi Annaka. *Physical Society of Japan, Journal,* v. 9, no. 3, May-June 1954, p. 354-358.

Structure changes due to cold work on polycrystalline specimens of superlattice alloys $AuCu_3$, AuCu, AgCd and AgZn. Tables, graphs. 10 ref. (N10, Au, Cu, Ag, Cd, Zn)

342-N. (English.) **Electron-Diffraction Study of Liquid-Solid Transition of Thin Metal Films.** Mieko Takagi. *Physical Society of Japan, Journal,* v. 9, no. 3, May-June 1954, p. 359-363.

Structure changes of thin films of lead, tin and bismuth at various temperatures. Diagrams, diffraction patterns, graph, tables. 10 ref. (N12, M22, Pb, Sn, Bi)

343-N. (English.) **Several Experiments Concerning the Production of Iron Single Crystals by the Recrystallization Method.** Mikio Yamamoto and Ryofu Miyasawa. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 5, no. 6, Dec. 1953, p. 493-504.

Production of carbon-free iron and strain-annealing techniques. Graphs, tables, micrographs, diagram. 24 ref. (N5, Fe)

344-N. (English.) **Study on High Chromium Steels. II. On the Anomaly of Alpha Solid Solution of Fe-Cr System at High Temperatures.** Yunoshin Imai and Kenzaburo Kumada. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 5, no. 6, Dec. 1953, p. 520-532.

Effects of prolonged heating at 500° C. Tables, graphs. 7 ref. (N6, SS)

345-N. (English.) **Mechanisms for the Development of Martensitic Transformation of a Face-Centered Cubic Structure Into a Body-Centered Tetragonal Structure.** Hideji Suzuki. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 1, Feb. 1954, p. 30-49.

Data calculated from two theoretical models agree with experimental observations on steel and iron-nickel alloys. Tables, diagrams. 20 ref. (N8, N9, CN, Fe, Ni)

346-N. (Dutch.) **Experiments of J. Keverian on the Origin of Graphite Nodules.** P. E. A. van Nieuwland. *Metalen,* v. 9, no. 13, July 15, 1954, p. 203-207.

Theory based on assumption that graphite nodules originate from graphite needles growing into gas bubbles. Experimental data agree with theory. Micrograph, tables, graph. 5 ref. (N12, CI)

347-N. (French.) **Reflections and Remarks Concerning Phenomena Accompanying the Tempering of Steels.** A. Sourdillon. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 414-430.

Effects of heating rate, time of holding in gamma range and grain size on austenite formation and its subsequent decomposition after cooling. Graphs, table, diagrams, photographs. 71 ref. (N8, J29, ST)

348-N. (French.) **TTT-Curves and Heat Treatments.** L. Habraken. *Revue universelle des mines,* v. 10, ser. 9, no. 7, July 1954, p. 473-489.

Defines and outlines present knowledge concerning TTT curves and their usefulness in heat treatments. Charts, micrographs. 27 ref. (N8, J general, ST)

349-N. (German.) **Tests for Clarifying the Transformation Behavior of Chromium Steel Forming Special Carbides.** Franz Wever and Walter Koch. *Stahl und Eisen,* v. 74, no. 16, July 29, 1954, p. 989-1000.

Changes in composition and shapes of carbides and ferrite grains during isothermal transformations. Micrographs, graphs. 10 ref. (N8, AY)

350-N. (Swedish.) **Eutectic Solidification in Grey, White and Mottled Cast Iron of Hypo-Eutectic Composition.** A. Hultgren, Y. Lindblom and E. Rudberg. *Gjuteriet,* v. 44, no. 7, July 1954, p. 109-124.

Samples quenched at predetermined points on cooling curves. Appearance of the graphite-austenite aggregates, their composition and their general manner of development, related to cooling curves, indicate direct formation from the melt by eutectic reaction. Graphs, micrographs, diagram, tables. 6 ref. (N12, CI)

351-N. Graphitization of Certain Fe-C-Ti Alloys. A. B. Beach and R. W. Heine. *American Foundrymen's Society, Preprint no.* 54-1, 1954, 4 p.

Nature of stable system and alloying behavior of titanium in white cast irons in the malleable iron composition range. Phase diagram, micrographs, tables. 9 ref. (N8, CI)

352-N. Graphitization of Rims in Malleable Iron. H. A. Schwartz and J. D. Hedberg. *American Foundrymen's Society, Preprint no.* 54-12, 1954, 4 p.

Progress of graphite formation, while annealing malleable iron between A_1 stable and A_1 metastable, temperatures was examined near the surface of a fairly heavy casting. Tables, micrographs. (N8, CI)

353-N. Effect of Plastic Deformation of Hard Iron on Subsequent Annealing. W. K. Bock. *American Foundrymen's Society, Preprint no.* 54-68, 1954, 4 p.

Indicates that plastic deformation of white iron produces increased speed of graphitization. A relation between amount of cold work and effect on graphitization is indicated. Micrographs, graph. 2 ref. (N8, Q24, J23, CI)

354-N. Effect of Cold Work on the Gamma → Alpha Transformation in Some Fe-Ni-Cr Alloys. B. Cina. *Iron and Steel Institute, Journal,* v. 177, Aug. 1954, p. 406-422 + 3 plates.

Explains precise joint alloying effects of nickel and chromium. Tables, graphs. 58 ref. (N8, SS)

355-N. Basic Processes Involved in Tempering Plain Carbon and Low-Alloy Steels. W. S. Owen. *Iron and Steel Institute, Journal,* v. 177, Aug. 1954, p. 445-449; disc., p. 449-450.

Possible mechanisms controlling the kinetics of reactions. Graphs, micrograph. 23 ref. (N8, J29, CN, AY)

356-N. Precipitation of Impurities at Dislocations in Heat-Treated Silicon. Sumner Mayburg. *Physical Review,* v. 95, ser. 2, Aug. 1, 1954, p. 838-839.

Heat treatment above or below 900° C. increases or decreases respectively room temperature conductivity. 5 ref. (N7, P11, Si)

357-N. Structural (Phase) Transformations in Iron-Graphite Powder Products During Sintering. V. I. Likhtman and I. N. Smirnova. *Henry Brutcher, Altadena, Calif., Translation no.* 3015, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 86, no. 6, 1952, p. 1151-1153.)

Previously abstracted from original. See item 241-N, 1953. (N6, H15)

358-N. Laws Governing the Coalescence of Carbides in Plain Carbon Steel During Isothermal Tempering. S. Z. Bokshtein. *Henry Brutcher, Al-*

tadena, Calif., Translation no. 3037, 13 p. (From *Zhurnal Tekhnicheskoi Fiziki*, v. 17, no. 12, 1947, p.1514-1520.)

Tests on 0.40 carbon steel at 1165° F. Kinetics of coalescence. Tables, graphs. 13 ref. (N8, J29, CN)

359-N. Kinetics of the First Stage of the Martensite Decomposition. G. Kurdyumov and L. Lysak. *Henry Brutcher, Altadena, Calif., Translation no.* 3041, 15 p. (From *Zhurnal Tekhnicheskoi Fiziki*, v. 19, no. 5, 1949, p. 525-531.)

Austenited decomposition as function of time at 80, 100 and 120° C. Discussion of Hägg's earlier interpretation. Graphs. 7 ref. (N8, CN)

360-N. Use of Ultrasonic Waves to Produce Orientation in Crystalline Substances. A. Kapustin. *Henry Brutcher, Altadena, Calif., Translation no.* 3066, 4 p. (From *Doklady Akademii Nauk SSSR*, v. 71, no. 3, 1950, p. 451-452.)

Experiments using gelatin, potassium sodium tartrate and hyposulfite. (N5)

361-N. Crystallization of Gray Iron as an Example of an Anomalous Eutectic. (Part VI of Paper "Effect of Foreign Nuclei Upon Crystallization of Metals and Alloys, Particularly on Formation of Eutectic in Gray Iron".) W. Patterson. *Henry Brutcher, Altadena, Calif., Translation no.* 3076, *24 p. (Slightly Condensed from Giesserei, Technisch-Wissensch. Beihefte,* 1952, nos. 6-8, p. 367-374.)

Effect of melting and superheating on supercooling. Effects of various additions on graphite and primary austenite. Table, graphs, micrographs. 4 ref. (N12, CI)

362-N. Influence of Elements Forming Sparingly Soluble Carbides Upon the Decomposition of Austenite. L. I. Kogan and R. I. Entin. *Henry Brutcher, Altadena, Calif., Translation no.* 3318, 8 p. (From *Doklady Akademii Nauk SSSR*, v. 94, no. 4, 1954, p. 693-696.)

Previously abstracted from original. See item 212-N, 1954. (N8, AY)

363-N. (English.) Preferred Orientation in Alpha-Uranium. C. M. Mitchell and J. F. Rowland. *Acta Metallurgica*, v. 2, no. 4, July 1954, p. 559-572.

Textures for various rolling temperatures. Derivation of unit cell probability. Mechanism of deformation during tension, compression and rolling. Graphs, diagrams, table. 9 ref. (N5, Q24, U)

364-N. (English.) X-Ray Measurement of Order in CuAu. B. W. Roberts. *Acta Metallurgica*, v. 2, no. 4, July 1954, p. 597-603.

Geiger counter spectrometer measurements on filings quenched from various annealing temperatures. Tables, graphs. 11 ref. (N10, Cu, Au)

365-N. (English.) Thermodynamics of Ordering Alloys. II. The Gold-Copper System. R. A. Oriani. *Acta Metallurgica*, v. 2, no. 4, July 1954, p. 608-615.

Tests using galvanic cell method show negative deviations from Raoult's law in agreement with previous work. Degrees of short-range order agree with X-ray data. Diagram, tables, graphs. 31 ref. (N10, Au, Cu)

366-N. (English.) Transformation in Indium-Thallium Alloys. A. H. Geisler. *Acta Metallurgica*, v. 2, no. 4, July 1954, p. 639-642.

Shear mechanism of phase transformations. Diagrams, table. 6 ref. (N6, In, Tl)

367-N. (English.) The Order-Disorder Transformation in Cu-Au Alloys Near the Composition Cu_3Au. J. B. Newkirk. *Acta Metallurgica*, v. 2, no. 4, July 1954, p. 644-645.

Analysis of previously published data. Graphs. 6 ref. (N10, Cu, Au)

368-N. (French.) Conditions of Appearance of the Widmanstätten Structure in the Particular Case of a Hypo-Eutectoid Steel. Albert Portevin, André Constant, and Georges Delbart. *Comptes rendus*, v. 239, no. 3, July 19, 1954, p. 209-212.

TTT-curves indicate that tempering constituents (pearlite, bainite, martensite) from decomposition of austenite furnish formation domains of Widmanstätten structure resulting from intergranular segregation of pro-eutectoid ferrite in austenite. Graphs, micrographs. 3 ref. (N8, CN)

369-N. (French.) Polygonization of Aluminum of Different Purities. Christian de Beaulieu, Jean Talbot and Georges Chaudron. *Comptes rendus*, v. 239, no. 3, July 19, 1954, p. 270-272.

Effects of low-temperature rolling, reheating and quenching. Micrographs. 3 ref. (N5, Al)

370-N. (French.) Structural Changes Taking Place During the Aging of a Cu, 2% Be Alloy. A. Saulnier. *Revue de métallurgie*, v. 51, no. 7, July 1954, p. 467-481; disc., p. 481.

Changes in the alpha solid solution are essentially due to precipitation, spontaneous work hardening and recovery. Beta constituents which are out of solution after quenching at 800° C. undergo eutectoid transformation during aging. Diagrams, micrographs, graphs. 12 ref. (N7, Cu)

371-N. (German.) Binary Layers. I. Diffusion of Silver Into Tellurium. G. C. Mönch. **II. Effect of Film Thickness, Temperature, and Base on the Diffusion of Silver Into Tellurium. III. Change of Volume in the Diffusion of Silver Into Tellurium.** Th. Mohr. **IV. Electron Refraction Investigations of Thin Silver-Tellurium Layers.** U. Zorll. *Annale der Physik*, v. 14, nos. 6-8, 1954, p. 363-389.

Includes photographs, diagrams, graphs, tables, micrographs, electron-refraction pictures. 27 ref. (N1, Ag, Te)

372-N. (German.) The Behavior of Rhenium Towards Silver and Copper. U. Holland-Nell and F. Sauerwald. *Zeitschrift für anorganische und allgemeine Chemie*, v. 276, nos. 3-4, June 1954, p. 155-158.

Shows that rhenium is practically insoluble in molten or solid copper and silver. 2 ref. (N12, Re, Cu, Ag)

373-N. (German.) Magnetially Oriented Structures in Permanent Magnets. Klaus J. Kronenberg. *Zeitschrift für Metallkunde*, v. 45, no. 7, July 1954, p. 440-447.

Electron-microscopic studies of oxide-film imprints on Alnico reveal highly dispersed oriented microstructures. Diagrams, graph, micrographs. 34 ref. (N5, P17, SG-n)

374-N. Manganese Modification of the Fe-S-O System. D. C. Hilty and Walter Crafts. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 959-967.

Pseudoternary solidification diagram for system containing 1% manganese in the solid phase. Experimental data. Graphs, tables, micrographs. 18 ref. (N12, ST)

375-N. Diffusion of Boron in Alpha Iron. Paul E. Busby and Cyril Wells. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 972.

Calculation based on penetration curves. Agrees with published data. Graph, table. (N1, Fe, B)

376-N. Precipitation of Iron Oxide From Alpha Fe-O Solid Solutions. A. U. Seybolt. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 979-982.

Metallographic study. Mechanism of oxygen diffusion. Partial Fe-O phase diagram. Graph, table, micrographs. 4 ref. (N7, N1, Fe)

377-N. Rate of Self-Diffusion in Polycrystalline Magnesium. P. G. Shewmon and F. N. Rhines. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 1021-1025.

Use of radioactive magnesium isotope to study diffusion rate. Techniques and experimental data. Diagrams, tables, graphs. 13 ref. (N1, Mg)

378-N. Self-Diffusivity Along Edge-Dislocation Singular Lines in Silver. A. A. Hendrickson and E. S. Machlin. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 1035-1037.

Surface - accumulation diffusion technique and experimental data. Radiographs, micrographs, table. 7 ref. (N1, Ag)

379-N. On the Nucleation of Pearlite. M. E. Nicholson. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 1071-1074.

Two-mode model shows that an alloying element can have different effects on hardenability depending on whether ferrite or cementite initiates pearlite nucleation. Graphs. 16 ref. (N2, ST)

380-N. Ordering Reaction of the Cu_3Pd Alloy. A. H. Geisler and J. B. Newkirk. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 1076-1082.

X-ray analysis indicates a tetragonal unit cell for the ordered phase. Increase of hardness is interpreted in terms of coherency strains. Graphs, diffraction patterns, tables, micrographs, diagrams. 8 ref. (N10, Cu, Pd)

381-N. Mechanism for the Origin of Recrystallization Nuclei. John P. Nielsen. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 1084-1088.

Proposes "geometrical coalescence" as logical origin for secondary recrystallization. Diagrams, micrograph, graph. 8 ref. (N5)

382-N. (German.) Application of Time-Temperature - Transformation Diagrams to Special Problems of Producing Highly-Stressed Welded Structural Parts. Franz Nehl and Adolf Rose. *Stahl und Eisen*, v. 74, no. 17, Aug. 12, 1954, p. 1054-1061; disc., p. 1061-1062.

TTT-diagram aids development of stress-resistant alloyed steels which are not susceptible to weld cracking; cooling processes during welding determined from temperature, microstructures and hardness. Graphs, micrographs. 5 ref. (N8, K general, Q25, AY)

383-N. (Russian.) Effect of Small Additions of Iron on Decomposition of Supersaturated Solid Solutions of Silver in Copper. V. I. Arkharov and I. P. Polikarpova. *Zhurnal Tekhnicheskoi Fiziki*, v. 24, no. 7, July 1954, p. 1244-1246.

Internal adsorption as cause of accelerating effect. Micrographs. 7 ref. (N7, Ag, Fe, Cu)

384-N. (Russian.) Solubility of Silver in Copper in Presence of Small Additions of Beryllium or Iron. V. I. Arkharov, S. D. Vangengeim, L. S. Magat and I. P. Polikarpova. *Zhurnal Tekhnicheskoi Fiziki*, v. 24, no. 7, July 1954, p. 1247-1253.

X-ray analysis, chemical compositions of alloys. Parameters. Tables, graphs. 5 ref.
(N12, Ag, Fe, Be, Cu)

P

Physical Properties and Test Methods

476-P. Hydrogen - Deuterium Exchange on Copper, Silver, Gold and Alloy Surfaces. Richard J. Mikovksy, Michel Boudart and Hugh S. Taylor. *American Chemical Society, Journal*, v. 76, July 20, 1954, p. 3814-3819.

Activation energies and temperature ranges. Diagram, graphs, tables. 25 ref. (P13, Cu, Ag, Au)

477-P. The Catalytic Decomposition of Carbon Monoxide on Large Metallic Single Crystals. Victor J. Kehrer, Jr., and Henry Leidheiser, Jr. *Journal of Physical Chemistry*, v. 58, July 1954, p. 550-555.

Catalytic activities of cobalt, copper, nickel, silver, iron, chromium and molybdenum crystals and on palladium and rhodium-plated films. Diagram, tables. 22 ref.
(P13, Co, Cu, Ni, Ag, Fe, Cr, Mo, Pd, Rh)

478-P. Comparative Electrical Properties of Some Metals. *Materials & Methods*, v. 40, Aug. 1954, p. 123.

Tabulated data for copper, brass, zinc, cast iron, steel, aluminum and magnesium.
(P15, Cu, Zn, CI, ST, Al, Mg)

479-P. Energy Band Shapes and Band Widths in Metals. S. Raimes. *Philosophical Magazine*, v. 45, 7th ser., no. 366, July 1954, p. 727-734.

The Bohm and Pines, Sommerfield and Hartree-Fock theories on density of states are compared. Graphs. 6 ref. (P10, Na, Mg, Al)

480-P. The Thermal Conductivity of Gallium Single Crystals at Low Temperatures. H. M. Rosenberg. *Philosophical Magazine*, v. 45, 7th ser., no. 366, July 1954, p. 767.

Broad agreement between anisotropy in both the thermal and electrical resistance. 2 ref.
(P11, P15, Ga)

481-P. (English.) The Change of the Refractive Index of Some Germanium Films Irradiated by Intense Light. Kozo Ishiguro and Toshiharu Hayashi. *Physical Society of Japan, Journal*, v. 9, no. 3, May-June 1954, p. 387-391.

Refractive index of films found to increase when color temperature of irradiating light source was about 3000° K. and to decrease when the temperature was 1000° K. Diagrams, graphs. 4 ref. (P17, Ge)

482-P. (English.) A Method of Automatic Measurement of Specific Heat. Tokutaro Hirone, Seijiro Maeda, Ichiro Tsubokawa and Noboru Tsuya. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 5, no. 6, Dec. 1953, p. 513-519.

Equipment and techniques for thermal analysis. Diagrams, graphs. 4 ref. (P12)

483-P. (English.) Electrical Properties of Tellurium Crystals at Very Low Temperatures. (Experiment With Liquid Helium). Tadao Fukuroi, Seiichi Tanuma and Yoshio Muto. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 6, no. 1, Feb. 1954, p. 18-29.

Experimental and theoretical study on single crystals of high-purity tellurium. Graphs, tables. 14 ref. (P15, Te)

484-P. (English.) On the Equilibrium Reaction Among Aluminium, Oxygen and Carbon in Molten Iron. Tetsuo Yagihashi and Zen-ichi Shibata. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 6, no. 1, Feb. 1954, p. 50-66.

Theory of deoxidation practice in steelmaking. Diagrams, tables, graphs. 16 ref. (P12, D2, ST)

485-P. (French.) Application of Hertzian Absorption of Iron Oxides to the Determination of Energy of Activation by Their Lattice Defects. Bernard Hagene. *Journal de physique et le radium*, v. 15, nos. 7-9, July-Sept. 1954, p. 583-584.

New experimental results permit calculation of activation energies of oxide mixtures. Graphs. 5 ref.
(P13, Fe)

486-P. (German.) Measuring the Ratio of the Alpha-Activity of U^{235} and U^{234} in Natural Uranium. E. Baldinger, P. Huber, K. P. Meyer and E. Würger. *Helvetica Physica Acta*, v. 27, no. 3, June 1954, p. 150-152.

Experimental procedure of determining relative frequency of alpha-radiation of U^{235} and U^{234}. Graph, table. 6 ref. (P13, U)

487-P. (French.) Electrical Conductivity of the Intermetallic Compounds Ca_2Si, Ca_2Sn, Ca_2Pb, ZnSb. G. Busch, P. Junod, U. Katz and U. Winkler. *Helvetica Physica Acta*, v. 27, no. 3, June 1954, p. 193-195.

Experimental measurements. Tables, graphs. 3 ref.
(P15, Ca, Si, Sn, Pb, Zn, Sb)

488-P. (French.) Hall Effect, Resistivity, and Self-Induced Magnetization in Irreversible Alloys. E. Ascher. *Helvetica Physica Acta*, v. 27, no. 3, June 1954, p. 206-207.

Quantitative interdependence between physical properties. 6 ref.
(P15, P16, SG-n)

489-P. (German.) Electrical Conductivity and Thermo-Electric Potential of the Intermetallic Compound Mg_3Sb_2. G. Busch, F. Hulliger and U. Winkler. *Helvetica Physica Acta*, v. 27, no. 3, June 1954, p. 195-196.

Specimen preparation, electrical conductivity, Hall effect and thermo-electric potential from room temperature to 1000° C. 3 ref.
(P15, Mg, Sb)

490-P. (German.) Thermal Conductivity of the Intermetallic Compound InSb. G. Busch and M. Schneider. *Helvetica Physica Acta*, v. 27, no. 3, June 1954, p. 196-198.

Values from room temperature to melting point. Graphs. 1 ref.
(P11, In, Sb)

491-P. (German.) Magnetic Susceptibility of Germanium. G. Busch and N. Helfer. *Helvetica Physica Acta*, v. 27, no. 3, June 1954, p. 201-204.

Study of temperature effect. Graphs. 4 ref. (P16, Ge)

492-P. (German.) Change of the Electrical and Magnetic Properties of Sb and InSb at the Melting Point. G. Busch and O. Vogt. *Helvetica Physica Acta*, v. 27, no. 3, June 1954, p. 241-248.

Dependence of physical properties on temperature. Diagrams, graphs. 7 ref. (P15, P16, Sb)

493-P. (German.) The Electrical Properties of the Intermetallic Compound Mg_3Sb_2. G. Busch, F. Hulliger and U. Winkler. *Helvetica Physica Acta*, v. 27, no. 3, June 1954, p. 249-258.

Positive Hall constant and thermo-electrical potential explained by greater mobility of holes over electrons. Includes determination of concentration, mobility and freedom numbers of electrons and holes. Graphs. 14 ref. (P15, Mg, Sb)

494-P. (German.) Effect of Condensation at Low Temperatures on Electrical Resistance and Superconductivity of Metals. W. Buckel and R. Hilsch. *Zeitschrift für Physik*, v. 138, no. 2, 1954, p. 109-120.

Experimental data on aluminum, zinc, indium, thallium, lead, mercury, gallium and bismuth. Graphs, table. 29 ref.
(P15, Al, Zn, In, Tl, Pb, Hg, Ga, Bi)

495-P. (Russian.) Theory of Relation of Spontaneous Magnetization of Metals and Alloys to Temperature in the Low-Temperature Range. E. Kondorskii and A. Pakhomov. *Doklady Akademii Nauk SSSR*, v. 96, no. 6, June 21, 1954, p. 1139-1142.

Mathematical analysis. 4 ref.
(P16, Fe)

496-P. (Russian.) Determination of Fermi Surface and Electron Velocities in a Metal by Magnetic Susceptibility Oscillations. I. M. Lifshits and A. V. Pogorelov. *Doklady Akademii Nauk SSSR*, v. 96, no. 6, June 21, 1954, p. 1143-1145.

Mathematical analysis. 1 ref.
(P16)

497-P. (Russian.) Effect of Surface-Active Substances on Decrement of Damping of Vibrations in Steel. G. V. Karpenko. *Doklady Akademii Nauk SSSR*, v. 97, no. 1, July 1, 1954, p. 81-83.

Effect of penetration of lubricating oil into micro-cracks. Table, graph. 8 ref. (P10, Q8, ST)

498-P. The Separation and Purification of Americium-241 and the Absorption Spectra of Tervalent and Quinquevalent Americium Solutions. G. R. Hall and P. D. Herniman. *Chemical Society, Journal*, 1954, July, p. 2214-2221.

A 25-mg. sample of $americium^{241}$ was studied. Ultra-violet spectra, graphs. 13 ref. (P17, Am)

499-P. The Magnetic Susceptibility of Lanthanum. O. M. Hilal and F. A. Saleh. *Chemical Society, Journal*, 1954, July, p. 2635.

5 ref. (P16, La)

500-P. On the Nature of Radiation Damage in Metals. John A. Brinkman. *Journal of Applied Physics*, v. 25, Aug. 1954, p. 961-970.

Introduces new concept in the case of damage to the lattice structure of heavy metals, called a displacement spike. Diagram, table, graphs. 11 ref. (P10, M26)

501-P. Factors Determining the Permanent Magnet Properties of Single Crystals of Fe_2NiAl. E. A. Nesbitt, H. J. Williams and R. M. Bozorth. *Journal of Applied Physics*, v. 25, Aug. 1954, p. 1014-1020.

Fine precipitated particles are elongated and the shape anisotropy of these particles is a major factor in determining the coercive force. Graphs, micrographs. 7 ref.
(P16, Ni, Fe, Al)

502-P. The Surface Migration of Carbon on Tungsten. Ralph Klein. *Journal of Chemical Physics*, v. 22, Aug. 1954, p. 1406-1413.

Field emission microscopy. Migration starts near 850° K. Micrographs, graph. 11 ref. (P10, W)

503-P. Vapor Pressure of Uranium. Everett G. Rauh and Robert J. Thorn. *Journal of Chemical Physics*, v. 22, Aug. 1954, p. 1414-1420.

Vapor effused from a Knudsen cell and "weighed" by count after thermal neutron irradiation. Table, graphs. 12 ref. (P12, U)

504-P. Analysis of Magnetoresistance and Hall Coefficient in *p*-Type Indium-Antimonide and *p*-Type Germanium. T. C. Harman, R. K. Willardson and A. C. Beer. *Physical Review*, v. 95, ser. 2, Aug. 1, 1954, p. 699-702.

Theoretical and experimental considerations. Equations developed as functions of parameters. Graphs. 10 ref. (P16, P15, In, Sb, Ge)

505-P. Ionization Probability Curves Near Threshold for Zn, Cd, and Hg. W. M. Hickam. *Physical Review*, v. 95, ser. 2, Aug. 1, 1954, p. 703-705.

Curve structure interpreted as result of auto-ionization of atomic states arising from single inner shell electron. Graphs, diagrams. 13 ref. (P15, Zn, Cd, Hg)

506-P. Hall Effect in Ferromagnetics. Clarence Kooi. *Physical Review*, v. 95, ser. 2, Aug. 1, 1954, p. 843-844.

Measurements of Hall effect as function of resistivity for iron-silicon alloys of 0 to 5% silicon. Graph, table. 5 ref. (P15, Fe)

507-P. Hyperfine Splitting in Spin Resonance of Group V Donors in Silicon. R. C. Fletcher, W. A. Yager, G. L. Pearson and F. R. Merritt. *Physical Review*, v. 95, ser. 2, Aug. 1, 1954, p. 844-845.

Measurements of samples with different concentrations of phosphorus, arsenic and antimony. Graphs. 4 ref. (P15, Si, P, As, Sb)

508-P. Antiferromagnetism in Metals. A. B. Lidiard. *Royal Society, Proceedings*, v. 224, ser. A, June 22, 1954, p. 161-176.

Simple formulation of an energy-band theory based on assumption that magnetically effective electrons are in nonlocalized states. Graphs, diagram. 39 ref. (P16)

509-P. The Theory of the Anomalous Skin Effect in Anisotropic Metals. E. H. Sondheimer. *Royal Society, Proceedings*, v. 224, ser. A, June 22, 1954, p. 260-272.

Dependence of surface impedance on orientation of crystal axis for plane metal surface and for circular wire. Graphs. 9 ref. (P15)

510-P. The Anomalous Skin Effect in Anisotropic Metals. A. B. Pippard. *Royal Society, Proceedings*, v. 224, ser. A, June 22, 1954, p. 273-282.

Theoretical form of the anisotropy of high-frequency surface resistance obtianed by the ineffectiveness concept. Diagrams, graphs. 6 ref. (P15)

511-P. Physical Properties of Metals. Clifford A. Hampel. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 623-643.

Survey of available data on the rare metals. Includes mechanical properties. Tables. 11 ref. (P general, Q general, EG-b)

512-P. Coercive Force of Quenched 1% C, 1.5% Cr Steel. B. K. Vainshtein and B. G. Livshits. *Henry Brutcher, Altadena Calif., Translation no.* 3056, 20 p. (From *Zhurnal Tekhnicheskoi Fiziki*, v. 19, no. 8, 1949, p. 871-881.)

Influence of retained austenite and martensite on physical properties. Micrographs, photographs, graphs. 11 ref. (P16, P general, AY)

513-P. Surface Tension and Heat of Vaporization of Metals. S. N. Zadumkin. *Henry Brutcher, Altadena, Calif., Translation no.* 3330, 7 p. (From *Doklady Akademii Nauk SSSR*, v. 92, no. 1, 1953, p. 115-118.)

Previously abstracted from original. See item 65-P, 1954. (P10, P12)

514-P. (English.) The Debye Temperature of $AuCu^3$ as a Function of Long-Range Order Parameter. D. B. Bowen. *Acta Metallurgica*, v. 2, no. 4, July 1954, p. 573-575.

Increase of Debye temperature measured by electrical resistance at 4.2 to 77° K. Graphs. 9 ref. (P12, N10, Au, Cu)

515-P. (English.) Thermodynamic Properties of Solid Aluminum-Zinc Alloys. J. E. Hilliard, B. L. Averbach and Morris Cohen. *Acta Metallurgica*, v. 2, no. 4, July 1954, p. 621-631.

Aluminum-rich solutions gave values consistent with quasi-chemical theory, but large deviations were found for solutions with more than 40 atomic % zinc. Diagram, graphs, tables. 34 ref. (P12, Al, Zn)

516-P. (French.) Study of Constant-Current Overvoltage in the Case of Nonstationary Diffusion for an Oxidation-Reduction System. Georges Feuillade. *Comptes rendus*, v. 239, no. 3, July 19, 1954, p. 268-270.

Energy transfer in electrochemical systems by combining overvoltage and diffusion equations. 6 ref. (P15)

517-P. (German.) Effect of Temperature on the Optical Constants of Copper, Silver, and Gold Down to 20° K. G. Joos and A. Klopfer. *Zeitschrift für Physik*, v. 138, nos. 3-4, 1954, p. 251-265.

Study made at 20 to 428° K. for the visible and ultraviolet spectrum and explained by the electron theory of metals. Diagrams, graphs. 47 ref. (P17, Cu, Ag, Au)

518-P. (German.) Transverse Magnetic Change in the Resistance of Indium-Antimony. H. Weiss and H. Welker. *Zeitschrift für Physik*, v. 138, nos. 3-4, 1954, p. 322-329.

Theory and experimental study. Graphs, diagrams, table. 8 ref. (P16, In, Sb)

519-P. (German.) The Blocking Layer Capacitance of Alloyed Germanium-Indium Rectifiers. H. U. Harten, W. Koch, H. L. Rath and W. Schultz. *Zeitschrift für Physik*, v. 138, nos. 3-4, 1954, p. 336-344.

Study of space charge and phase displacement between current and voltage on rectifier capacitance. Diagrams, graphs. 19 ref. (P15, Ge, In)

520-P. (German.) Determination of Thermodynamic Activities by Means of Radioactive Isotopes. Ulrich Gonser. *Zeitschrift für physikalische Chemie (Frankfurt)*, v. 1, nos. 1-2, Apr. 1954, p. 1-20.

Vapor-pressure isotherm and thermodynamic activity of lead and bismuth. Experimental details. Diagrams, tables, graphs. 23 ref. (P12, Pb, Bi)

521-P. (German.) Determination of the Mutual Electronic Effect Between Adsorbed Foreign Molecules and the Surface of Thin Nickel Layers at Low Temperatures by Means of Electric Resistance Measurements. R. Suhrmann and K. Schulz. *Zeitschrift für physikalische Chemie (Frankfurt)*, v. 1, nos. 1-2, Apr. 1954, p. 69-97.

Includes diagrams, tables, graphs. 20 ref. (P15, Ni)

522-P. (German.) Formation of the Electrochemical Double Layer on Equilibrium Electrodes. H. J. Oel and H. Strehlow. *Zeitschrift für physikalische Chemie (Frankfurt)*, v. 1, nos. 3-4, May 1954, p. 241-255.

Development of indirect method of determining the Billiter potential of copper and bismuth electrodes where current flow is neutralized. Diagrams, tables, graphs. 7 ref. (P15, Cu, Bi)

523-P. Equilibrium Pressure Measurements Above ZnS From 680° to 825° C. C. Law McCabe. *Journal of Metals*. v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 969-971.

Experimental data show vapor in equilibrium with solid zinc sulfide is predominantly Zn and S_2. Graph, table. 13 ref. (P12, N15, Zn)

524-P. Ferromagnetism of Certain Manganese-Rich Alloys. E. R. Morgan. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 983-988.

Tests on manganese-aluminum-carbon alloys following various heat treatments. Tables, micrographs, graph, X-ray pattern. 11 ref. (P16, Mn, Al)

525-P. Coefficients of Thermal Expansion for Zirconium. R. B. Russell. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 1045-1052.

X-ray back-reflection measurement of lattice parameters from 0 to 600° C. shows coefficients to be straight-line functions of temperature. Hafnium depresses the mean coefficient. Tables, photographs, graphs. 35 ref. (P11, Zr)

526-P. Viscosity and Density of Liquid Lead-Tin and Antimony-Cadmium Alloys. H. J. Fisher and A. Phillips. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 1060-1070.

Logarithmic decrement method used to determine influence of temperature and composition. Activation energies for viscosity determined. Diagrams, tables, graphs. 40 ref. (P10, P13, Pb, Sn, Sb, Cd)

527-P. Correlation Between Microstructure and Resistivity of Transforming Ti-Mn Alloys. D. J. DeLazaro and D. W. Levinson. *Journal of Metals*, v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Sept. 1954, p. 1089-1092.

Tests at 700, 600, 500 and 400° C. on alloys containing 6 to 10 weight % manganese. Graphs, micrographs. 4 ref. (P15, M27, Ti, Mn)

528-P. (German.) Density of Molten Metals and Alloys. A. Schneider, A. Stauffer and G. Heymer. *Naturwissenschaften*, v. 41, no. 14, July 1954, p. 326-327.

Brief review of literature. Graph, table. 13 ref. (P10)

529-P. (German.) Explanation of Electron Emission of Metals and Nonmetals After Machining and Irradiation. H. Nassenstein. *Naturwissenschaften*, v. 41, no. 14, July 1954, p. 329.

Formation of densely populated electron levels by lattice disturbances. 4 ref. (P15)

530-P. (Russian.) Method of Studying Rates of Electrochemical Reactions. A. T. Vagramian and Z. A. Solov'eva. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 6, June 1954, p. 1153-1157 + 2 plates.

Deposition of cobalt and chromium, time in solution, changing current strength and polarization. Diagram, graphs. 6 ref. (P15, Cr, Co, Zn)

531-P. (Russian.) Influence of Surface Levels on Electrical Properties of Fine-Grained Films of Germanium, Silicon, and Tellurium. Ia. E. Pokrovskii. *Zhurnal Tekhnicheskoi Fiziki*, v. 24, no. 7, July 1954, p. 1229-1243.

Relation of Hall effect, grain size and resistance of semi-conductor films produced in vacuum over wide range of temperature. Graphs, tables. 22 ref. (P15, Ge, Te, Si)

532-P. (Russian.) Influence of Foreign Ions on Potential of Copper Separation (Deposition). V. V. Mikhailov. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 6, June 1954, p. 1067-1075.

Concentrations of additions, tem-

peratures, energy of absorption of dehydrated and hydrated ions, and of interactions of these ions with polarized copper atom. Tables, graphs, diagram. 21 ref. (P15, Cu)

533-P. (Book.) **Ferromagnetic Domains.** K. H. Stewart. 188 p. 1954. Cambridge University Press, London, N.W. 1, England. 25S. Also 32 East 57th Street, New York 22, N. Y. $4.75.

Factors affecting behavior of individual domains, combination of domains in ferromagnetic structures, and properties of materials. (P16)

Q Mechanical Properties and Test Methods; Deformation

840-Q. An Experiment to Illustrate Creep. Use of Costly Equipment Avoided. N. S. J. Grassam and A. Prince. *Engineering,* v. 178, July 16, 1954, p. 74-75.

Rapid demonstration without use of costly and complicated equipment. Diagrams, graphs. 5 ref. (Q3)

841-Q. Seamless Steel Gas Cylinders: Significance of Safety Factor in Design. S. E. Mitchell. *Engineering,* v. 178, July 16, 1954, p. 75-76.

Application of safety factor to the design. Possible unification of present diverse methods. Table, graph. (Q23, ST)

842-Q. Stress in Electrodeposits. R. A. F. Hammond. *Institute of Metal Finishing, Bulletin,* v. 4, Summer 1954, p. 145-162.

Stress measurement and influence of various factors on stress. Tables, diagrams, graphs. 21 ref. (Q25, L17)

843-Q. Nonsinusoidal Buckling Modes of Sandwich Plates. J. N. Goodier and C. S. Hsu. *Journal of the Aeronautical Sciences,* v. 21, Aug. 1954, p. 525-532.

Nonsinusoidal modes at lower critical loads explored by means of simplified core slab theory. Diagrams, graphs. 6 ref. (Q28)

844-Q. On the Concept of Stability of Inelastic Systems. D. C. Drucker and E. T. Onat. *Journal of the Aeronautical Sciences,* v. 21, Aug. 1954, p. 543-548, 565.

Simple models used to show differences between buckling in the plastic range and classical elastic instability. Comparison of static and kinetic criteria and their interrelations. Diagrams, graphs. 9 ref. (Q28, Q21)

845-Q. Effect of Aluminum on the Low Temperature Properties of Relatively High Purity Ferrite. H. T. Green and R. M. Brick. *Journal of Metals,* Aug. 1954; v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 906-913.

Aluminum reduced yield and flow stresses of iron but had little or no effect on ductility. Effects of temperature and composition on strain hardening. Tables, graphs. 13 ref. (Q23, Fe)

846-Q. Some Observations on Grain Boundary Shearing During Creep. Bernard Fazan, Oleg D. Sherby and John E. Dorn. *Journal of Metals,* Aug. 1954; v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Aug. 1954, p. 919-922.

Contribution of grain boundary shearing at same stress depends upon a temperature-compensated time, where the activation energy was similar to that for total high-temperature creep. Micrographs, tables. 12 ref. (Q3, Al)

847-Q. Maximum Shear Stress. A. R. Holowenko and H. G. Laughlin. *Machine Design,* v. 26, Aug. 1954, p. 159-161.

Clarification of some misconceptions in calculation of stress at a point for two-dimensional loading. Diagrams. (Q2)

848-Q. How Nuclear Radiation Affects Engineering Materials. D. O. Leeser. *Materials & Methods,* v. 40, Aug. 1954, p. 109-120.

Effect of radiation on mechanical and physical properties of metals. Photographs, tables, diagrams. 11 ref.
(Q general, P general, CN, SS, Ni)

849-Q. Microcracks in Metals. *Metal Industry,* v. 85, July 23, 1954, p. 66.

Theories and experiments in the anisotropy of metals. 2 ref. (Q26)

850-Q. The Creep Properties of 99.8% Purity Aluminium at 20-80° C. and at 250 and 450° C. J. McKeown, R. Eborall and R. D. S. Lushey. *Metallurgia,* v. 50, no. 297, July 1954, p. 13-15.

Data provide source from which design stresses may be obtained. Tables, photographs, micrographs. (Q3, Al)

851-Q. Effect of Sigma Phase on Properties of Alloys. Adolph J. Lena. *Metal Porgress,* v. 66, Aug. 1954, p. 94-99.

Effect on notch-sensitivity, ductility at room and elevated temperature, tensile strength and corrosion resistance of stainless steels. Graphs, micrographs, table. (Q23, M27, R general, SS)

852-Q. The Propagation of Longitudinal Elastic Waves Along Cylindrical Bars. H. Kolsky. *Philosophical Magazine,* v. 45, 7th ser., no. 366, July 1954, p. 712-726.

Theoretical discussion of velocity of waves. Graphs, diagrams. 23 ref. (Q21)

853-Q. The Temperature Dependence of the Critical Shear Stress and of Workhardening of Metal Crystals. Alfred Seeger. *Philosophical Magazine,* v. 45, 7th ser., no. 366, July 1954, p. 771-773.

Analysis of stresses in neighborhood of dislocations. 2 ref. (Q2)

854-Q. Additional Static and Fatigue Tests of High-Strength Aluminum-Alloy Bolted Joints. E. C. Hartmann, Marshall Holt and I. D. Eaton. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3269, July 1954, 42 p.

Tests on 75S-T6, 24S-T4, and 14S-T6 high-strength aluminum alloys. Micrographs, photographs, graphs, diagrams, tables. 5 ref.
(Q7, Q27, Al)

855-Q. Hardness and Its Measurement. Vincent E. Lysaght. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 67-83.

Survey of hardness testing equipment and applications. Microhardness testing. Photographs, diagrams, tables. (Q29)

856-Q. (English.) **Circular Plates Subjected to Radially Symmetrical Transverse Load Combined With Uniform Compression or Tension in the Plane of the Plate.** Ove Pettersson. *Acta Polytechnica (Mechanical Engineering Series),* v. 3, no. 1, 1954, 31 p.

Determination of buckling loads. Graphs, tables, diagrams. 13 ref. (Q28)

857-Q. (English.) **Some Experiments on the Embrittlement of Malleable Iron.** Nobuhisa Tsutsumi. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 19-22.

Effects of phosphorus content and annealing and quenching treatment on ductility. Table, diagrams, micrographs. (Q23, J23, J26, CI)

858-Q. (English.) **Research on the Aluminium-Silicon-Zinc System Alloys for Castings. III.** Shigeo Oya. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 22-26.

Comparison of mechanical properties of sand and permanent mold castings. Diagrams micrographs.
(Q general Al Si, Zn)

859-Q. (English.) **The Fatigue of Carbon Steel. III.** Hiroshi Yamanouchi and Takeshi Inukai. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 42-43.

Determination of progress of fatigue by etching and by ultrasonic attenuation. Table, micrographs, graphs. (Q7, CN)

860-Q. (English.) **On Impact Compression of Short and Long Column.** Hiroshi Yamanouchi and Yuji Matsuura. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 48-49.

Determination of critical values of dynamic buckling. Diagram, tables, graphs. (Q28)

861-Q. (English.) **The Mechanical Strength of Special Fuse-Alloys.** Fusao Hayama. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 53-56.

Tensile and creep determinations on lead-bismuth-tin alloys. Diagrams, tables, graphs.
(Q27, Q3, SG-d)

862-Q. (English.) **Young's Modulus of Non-Ferrous Alloys. II. Effects of Cold-Rolling.** I. Iitaka and T. Morooka. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 60-62.

Relation between cold rolling and Young's modulus of 70-30 and 60-40 brasses. Tables, graphs. 2 ref.
(Q21, Cu)

863-Q. (French.) **Surface Extensometry by Brittle Coating. Reports of the S.N.E.C.M.A.** R. Fleury and A. Trivouss. *DOCAERO; revue documentaire de la technique aéronautique mondiale,* 1954, no. 28, p. 33-38.

Brief study of brittle coating stress analysis. Photographs, diagrams, graph. 4 ref. (Q25)

864-Q. (French.) **Effect of Lead and Tin on the Mechanical Properties of High-Strength Brass.** Marcel Cirou. *Fonderie,* 1954, no. 102, July, p. 4040-4050.

Breaking strength, Brinell hardness and other characteristics of brasses with varying percentages of lead and tin. Tables, graphs, diagram, micrographs. 2 ref.
(Q general, Cu)

865-Q. (French.) **News of the International Welding Institute: Report of Committee 10-11. Residual Stresses and Relaxation of Stresses.** R. Weck. *Revue de la Soudure* (Brussels), v. 10, no. 2, 1954, p. 87-88.

Relaxation by peening and low temperature treatment. Influence of residual stresses on initiation of brittle fracture.
(Q25, G23, ST, Cr, Ni, V, Mo)

866-Q. (German.) **Improving the Mechanical Properties of Sintered Steel by the Addition of Phosphorus.** F. Eisenkolb. *Planseeberichte für Pulvermetallurgie,* v. 2, no. 1, June 1954, p. 2-14.

Effects of sintering times, temperatures, rates of heating and cooling, phosphorus content and type of iron powder. Tables, photographs, diagrams, graphs. 7 ref.
(Q general, H15, ST)

867-Q. (Russian.) **Solution of the Cauchy Problem for a System of**

Equations in the Theory of Elasticity of a Heterogeneous Elastic Medium. V. M. Babich. *Doklady Akademii Nauk SSR*, v. 96, no. 6, June 21, 1954, p. 1125-1128.
Mathematical analysis. 6 ref. (Q21)

868-Q. (Russian.) Hardening Coefficient of Metallic Monocrystals. L. A. Shreiner and G. I. Epifanov. *Doklady Akademii Nauk SSSR*, v. 97, no. 1, July 1, 1954, p. 85-87.
Rate of hardening of cadium, lead and zinc increased with increase in deformation. Diagram. 4 ref. (Q24, Cd, Pb, Zn)

869-Q. The Service Life of Aircraft Structures. F. Turner. *Aircraft Engineering*, v. 26, Aug. 1954, p. 260-263.
Loads and service conditions, factors of safety, allowable stresses and statistical examination of fundamentals upon which aircraft stressing is based. Graphs. 16 ref. (Q25, S21)

870-Q. Effect of Graphite Flake Size on Tensile and Fatigue Properties of Gray Cast Iron. R. W. Lindsay and J. H. Hoke. *American Foundrymen's Society, Preprint no.* 54-20, 1954, 8 p.
Increase of graphite flake size shown to cause decreases in tensile strength, apparent modulus of elasticity in tension and endurance limit. Tables, micrographs, graphs. 26 ref. (Q23, Q7, CI)

871-Q. Mechanical Properties of Aluminum Die-Casting Alloys. C. O. Smith. *American Foundrymen's Society, Preprint no.* 54-24, 1954, 7 p.
Tensile and fatigue properties at various temperatures. Tables, graphs, photographs. 5 ref. (Q23, Q7, Al)

872-Q. Importance of Cooling Rate on Physical Properties of Gray Cast Irons. Jules Henry. *American Foundrymen's Society, Preprint no.* 54-28, 1954, 8 p.
Effect on microstructure, strength and hardness. Graphs, diagram, tables, micrographs. 10 ref. (Q23, Q29, M26, E25, CI)

873-Q. Some Factors Affecting Fatigue Strength of Aluminum Alloy Sand Castings. Marshall Holt. *American Foundrymen's Society, Preprint no.* 54-29, 1954, 9 p.
Effect of specimen preparation methods, discontinuities and inclusions. Diagram, tables, photographs, graphs. (Q7, Al)

874-Q. Evaluation of Transient Temperatures and Stresses. R. J. Fritz. *ASME, Transactions*, v. 76, Aug. 1954, p. 913-920; disc., p. 920-921.
Design factors and thermal stresses necessary in design evaluations. Graphs, table. 29 ref. (Q25)

875-Q. Apparatus for Study of Effects of Cyclic Thermal Stresses on Ductile Metals. L. F. Coffin, Jr., and R. P. Wesley. *ASME, Transactions*, v. 76, Aug. 1954, p. 923-930.
Test apparatus for determining resistance to thermal stress-fatigue damage, and understanding of fatigue phenomenon. Diagrams, photographs. 4 ref. (Q25, Q7)

876-Q. A Study of the Effects of Cyclic Thermal Stresses on a Ductile Metal. L. F. Coffin, Jr. *ASME, Transactions*, v. 76, Aug. 1954, p. 931-949; disc., p. 949-950.
Test results and interpretation of cyclic strain and fatigue failure arising from cyclic thermal stresses. Diagrams, photographs, graphs, micrograph. 44 ref. (Q25, Q7)

877-Q. Foundry Practice. VIII. The Cast Metal. William H. Salmon. *Edgar Allen News*, v. 33, Aug. 1954, p. 183-184.
Mechanical testing of castings. Graphs, table. (To be continued.) (Q general, E general, CI)

878-Q. Testing of Columns With Uniformly Distributed Transverse Loads. Paul C. Paris. *Engineering Journal*, v. 37, Aug. 1954, p. 945-949.
Theory, equipment and procedures. Application of loads, gaging. Photographs, diagrams, graphs. (Q28)

879-Q. Yield-Stress-Strain Curves and Values of Mean Yield Stress of Some Commonly Rolled Materials. R. B. Sims. *Iron and Steel Institute, Journal*, v. 177, Aug. 1954, p. 393-399.
Yield stresses in plane compression measured during cold rolling for design and production applications. Graphs, table, photograph, diagram. 7 ref. (Q23)

880-Q. Hardening of Pd by Cathodic Hydrogen. Takesi Sugeno and Masamichi Kowaka. *Journal of Applied Physics*, v. 25, Aug. 1954, p. 1063-1064.
Effects of duration of hydrogen charging and discharge time on hardness. Graphs. 2 ref. (Q29, Pd)

881-Q. Elastic Relaxation and Grain Boundary Diffusion in Cadmium. Y. L. Yousef and R. Kamel. *Journal of Applied Physics*, v. 25, Aug. 1954, p. 1064.
Internal friction and Young's modulus relaxation, in relation to intergrain diffusion, investigated for pure cadmium in the polycrystalline and single crystal states. (Q22, N1, Cd)

882-Q. Measurements of Internal Energy in Cold-Worked Metals. F. Eugene. *Microtecnic (English Ed.)*, v. 8, no. 3, 1954, p. 127-134; disc., p. 134.
Soft steels, copper, and lead tested by thermo-electric methods. Photographs, diagram, tables. 11 ref. (Q22, CN, Cu, Pb)

883-Q. Second-Order Effects in the Deformation of Elastic Bodies. A. E. Green and E. B. Spratt. *Royal Society, Proceedings*, v. 224, ser. A, July 7, 1954, p. 347-361.
Systematic theory of successive approximation for both compressible and incompressible bodies, using general tensor notations. 11 ref. (Q21)

884-Q. New Principles for the Calculation of Welded Joints. C. G. J. Vreedenburgh. *Welding Journal*, v. 33, Aug. 1954, p. 743-751.
Method calculates strength of welded joints by an empirically determined limit curve. Photographs, diagrams. 10 ref. (Q23)

885-Q. Effects of Temperature on Weld Metal Properties. J. Heuschkel. *Welding Journal*, v. 33, Aug. 1954, p. 388S-397S.
Tensile characteristics of arc-deposited carbon steel weld metal for two covered electrodes over a temperature range of −300 to +1400° F. Diagrams, tables, graphs, photographs. (Q23, K1, CN)

886-Q. Alloy Welds Deposited in "Unalloyed" Titanium Base Metal. II. C. E. Hartbower and Daniel M. Daley, Jr. *Welding Journal*, v. 33, Aug. 1954, p. 401S-414S.
Investigation to develop method for improving toughness and strength of weld joints in "unalloyed" titanium. Notched-bar impact testing. Graphs, tables, micrographs, diagram. 16 ref. (Q23, Q6, Ti)

887-Q. Influence of Columbium and Titanium Upon Plastic Properties of Stainless and Heat-Resisting Steels at High Temperatures. N. S. Alferova. *Henry Brutcher, Altadena, Calif., Translation no.* 2795, 11 p. (From *Stal*, v. 8, no. 10, 1948, p. 911-916.)
Mechanical properties and hot working characteristics. Graphs, diagram, photographs, micrographs. (Q23, F general, SS)

888-Q. Influence of Chemical Composition Upon the Hardness of Cast Iron. N. K. Ipatov. *Henry Brutcher, Altadena, Calif., Translation no.* 3063, 4 p. (From *Liteinoe Proizvodstvo*, v. 3, no. 8, 1952, p. 28.)
Distribution of hardness in 250 specimens from 107 heats. Table, graph. 2 ref. (Q29, CI)

889-Q. Strain Measurements in Gray Cast Iron by X-Ray and Mechanical Methods. V. Hauk. *Henry Brutcher, Altadena, Calif., Translation no.* 3289, 18 p. (Condensed from *Archiv für das Eisenhüttenwesen*, v. 23, nos. 9-10, 1952, p. 353-361.)
Previously abstracted from original. See item 1061-Q, 1952. (Q25)

890-Q. Some Observations Regarding the Creep Behavior of Zirconium-Alloyed Steels at 500° C. W. A. Fischer. *Henry Brutcher, Altadena, Calif., Translation no.* 3328, 10 p. (From *Archiv für das Eisenhüttenwesen*, v. 24, nos. 9-10, 1953, p. 397-400.)
Previously abstracted from original. See item 52-Q, 1954. (Q3, AY)

891-Q. Effects of Residual Stresses on the Behavior of Structures. F. Campus. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 1-21.
Measurement, origins, latent energy, comparison with working stress, effects on initiation and propagation of fracture. Photographs, diagrams, graphs. 10 ref. (Q25, ST)

892-Q. Residual Stresses in Welded Pressure-Vessel Manufacture. H. Harris. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 23-32.
Case histories show a combination of factors responsible for problems in welding and residual stress. Diagrams, radiograph. (Q25, K general, ST)

893-Q. Some Typical Cases Where Residual Stresses Set Up by Welding Appear to Have Contributed to Ship Structural Failures. D. Arnott. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 33-39.
Case histories demonstrate locked-up stresses as important factor in causing structural failures in welded ships. Photographs. (Q25, K general, ST)

894-Q. Residual Stresses as a Factor in Ship Fractures. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 41-44.
Residual stresses do not impair strength if material is in a notch ductile condition. 4 ref. (Q25, ST)

895-Q. Some Notes on Typical Residual Stresses Encountered in Welded Ships. P. Ffield. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 45-74.
Relation of stresses to strength, consideration of thermal stresses. Diagrams, photographs, graphs, table. 5 ref. (Q25, K general, ST)

896-Q. Some Considerations Regarding the Generation and Importance of Residual Welding Stresses. L. E. Benson. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 75-83.
Factors favoring development of high residual welding stresses and their relation to failures at all temperatures and under static and dynamic loading. Micrographs, diagrams. 4 ref. (Q25, K general, ST)

897-Q. Residual Stresses in Welding. W. Spraragen. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 85-102.
Local and reaction stresses in stat-

ic loading, fatigue, impact, dimensional stability, distortion and corrosion. Methods to relieve stresses. Diagrams, graph. 23 ref. (Q25, Q23, Q6, Q7, R general, K general, ST)

898-Q. The Significance of Residual Stresses. C. W. MacGregor. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 103-126.

Classification of stresses, effects on flow and fracture strength. Graphs, diagrams, tables. 37 ref. (Q25, ST)

899-Q. Some Remarks on the Influence of Residual Stresses on the Brittle, Plastic, and Fatigue Behavior of Structures. P. P. Bijlaard. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 127-138.

Methods for avoiding high triaxial stresses. Diagrams. 11 ref. (Q25, Q23, Q7, ST)

900-Q. The Influence of Residual Stresses on the Behavior of Ductile Structures. M. R. Horne. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 139-161.

Effect on yield strength, plastic collapse, "shakedown" load, deflections and behavior of compression members. Diagrams, graphs, table. 22 ref. (Q25, Q23, CN)

901-Q. Shakedown of Elastic-Plastic Structures. P. G. Hodge, Jr. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 163-185; disc., p. 186-191.

Theorem for trusses, beams and frames, application of principles, paplicability of shakedown analysis. Diagrams, graphs, tables. 29 ref. (Q21, Q23)

902-Q. Microstresses Originated by Gas Inclusions. N. J. Petch. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 193-199.

Methods of gas production in metals and their effects. Tables. 14 ref. (Q25, N1)

903-Q. The Effect of Residual Stresses on High-Speed Impact Resistance. J. Miklowitz. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 201-217.

Need for experimental work in understanding effect of stresses in welded structures and their ability to withstand shock-type loadings. Tables, graph, photograph. 15 ref. (Q25, Q6, CN)

904-Q. Correlation of Residual Stresses With Fatigue Strength of Machine Elements and Related Phenomena. O. J. Horger and H. R. Neifert. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 219-253.

Fatigue tests on full-size members involving different states of residual stress and heat treatment. Diagrams, photographs, graphs, tables, micrographs. 37 ref. (Q25, Q7, J general, ST)

905-Q. Effect of Residual Stress on the Failure of Engineering Materials. D. Rosenthal. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 255-265; disc., p. 267-269.

Failure by yielding, static and dynamic fracture and fatigue failure. Diagrams, table, graph. 28 ref. (Q25, Q7, Q26)

906-Q. Measurement of Residual Stress. D. Rosenthal. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 271-283.

Theoretical assumptions and limitations of mechanical methods of measurement. Diagrams. 26 ref. (Q25)

907-Q. Residual Stresses Associated With Lattice Strains. G. B. Greenough. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 285-296.

Complicating factors determined by X-ray methods. Diagrams, graph, table. 13 ref. (Q25)

908-Q. Precautions to be Used in the Measurement and Interpretation of Residual Stresses by X-Ray Technique. W. S. Hyler and L. R. Jackson. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 297-303.

Differences in macro and microstress systems, assumption for isotropic behavior, limitations of X-ray measurements. Diagram, table. 7 ref. (Q25)

909-Q. Complete Determination of the State of Residual Stress in Solid and Hollow Metal Cylinders. H. Bühler. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 305-329.

Internal and external techniques. Graphs, diagrams. 30 ref. (Q25)

910-Q. Determination of Residual Stresses Below the Surface. W. Soete and R. VanCrombrugge. Paper from "Residual Stresses in Metals and Metal Construction". Reinhold Publishing Corp., p. 331-334.

Use of three strain gages permits reading while drilling. Relaxed strains a function of hole depth. Graphs, diagram. 3 ref. (Q25)

911-Q. (English.) **The Effect of a Surface Oxide Film on Torsional Relaxation.** B. I. Edelson and W. D. Robertson. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 583-590.

Tests on polycrystalline cadmium wires. Abnormal after-effect depends on presence and elastic properties of a surface film. Explanation by dislocation barrier theory. Diagram, graphs, tables. 9 ref. (Q1, Cd)

912-Q. (English.) **The Elastic Constants of Copper Alloys.** J. R. Neighbours and Charles S. Smith. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 591-596.

Data for single crystals of dilute solutions of aluminum, silicon, zinc, gallium and germanium in copper. Changes of shear constants in terms of electrostatic and ionic contributions. Tables. 14 ref. (Q21, Cu, Al, Si, Zn, Ga, Ge)

913-Q. (English.) **Internal Friction in Oxygen-Vanadium and Nitrogen-Vanadium Solid Solutions.** R. W. Powers. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 604-607.

Activation energies for peaks occurring at 186 and 272° C. Graphs. 10 ref. (Q22, P13, V)

914-Q. (English.) **Effect of Orientation Difference on the Plastic Deformation of Aluminum Bicrystals.** K. T. Aust and N. K. Chen. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 632-638.

Techniques for growing and testing single and bicrystal specimens. Results discussed in terms of slip activation and obstruction of dislocations at grain boundaries. Photograph, micrographs, diagram, graphs, table. 15 ref. (Q24, Al)

915-Q. (English.) **Bending Creep of "Duplex" Zinc Single Crystals.** R. Eisner. *Acta Metallurgica,* v. 2, no. 4, July 1954, p. 642-643.

Tests with progressively higher constant moments on 31 crystals. Effects of stress reversal, etching and electropolishing. 3 ref. (Q3, Zn)

916-Q. (English.) **Studies on the Creep of Low-Carbon Steel.** Toshio Nishihara, Shuji Taira and Kichinosuke Tanaka. *Memoirs of the Faculty of Engineering, Kyoto University,* v. 16, no. 2, Apr. 1954, p. 79-99.

Test equipment and results, characteristics analyzed, and results under bending and twisting moment. Diagrams, graphs, tables. 3 ref. (Q3, CN)

917-Q. (English.) **On Fundamental Equation of the Dynamical Behaviours of Nonlinear Visco-Elastic Bodies.** Yoshikazu Sawaragi and Hidekatsu Tokumaru. *Memoirs of the Faculty of Engineering, Kyoto University,* v. 16, no. 2, Apr. 1954, p. 100-111.

Theory and formulation of equations for strain and stress relaxation. Diagrams, graphs. 1 ref. (Q21)

918-Q. (French.) **Effect of Preliminary Cold Working on Brittleness Due to the Hydrogen in Steels.** Pierre Amiot, Pierre Azou, and Paul Bastien. *Comptes rendus,* v. 239, no. 2, July 12, 1954, p. 164-166.

Includes graphs. 5 ref. (Q23, AY)

920-Q. (French.) **Geometric Form of Watch Springs.** Paul George. *Comptes rendus,* v. 239, no. 3, July 19, 1954, p. 236-237.

Area of maximum fatigue and breaking point. Finding ideal geometrical form. (Q7, T8, ST)

921-Q. (French.) **Surface Granulation After Plastic Deformation: Relationship to Cold Working and Annealing Conditions.** J. Hérenguel and F. Santini. *Revue de métallurgie,* v. 51, no. 7, July 1954, p. 482-488; disc., p. 488.

Cold working causes progressive reduction and eventual disappearance of granulation if the amount of cold working is sufficiently great. Photographs, graphs, tables. 7 ref. (Q24, Al)

922-Q. (French and German.) **Internal Stresses and Warping of Watch-Part Blanks.** W. Brandt. *Pro-Metal,* v. 6, no. 39, June 1954, p. 354-359.

Cause, calculation and elimination of internal stresses. Effect of tempering temperature on mechanical properties of brass. Graphs, table, diagrams. (Q25, Q general, Cu)

923-Q. (German.) **Orientation Dependence of Plastic Deformation of Slightly Elongated Aluminum Monocrystals.** Georg Masing and Helmut Weik. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 417-428.

Preparation of single crystals, determination of critical shear stress, plastic stress-strain curves, flow curves and their peculiarities. Diagrams, graphs, table. 40 ref. (Q24, Al)

924-Q. (Russian.) **Change in Structure and Properties of Metal Used in High-Pressure Electric Power Plants.** A. Z. Kontorovskii. *Energetik,* v. 2, no. 7, June 1954, p. 23-26.

Chemical analysis, microstructure, and stress analysis of boiler pipes, etc. Tables, micrographs. (Q25, M27, AY)

925-Q. (Russian.) **Elastoplastic Distortion of a Beam With Initial Stresses.** V. V. Moskvitin. *Moskovskogo Universiteta, Vestnik, Seriia Fiziko-Matematicheskikh i Estestvennykh Nauk,* v. 4, no. 6, June 1954, p. 47-58.

Mathematical analysis of deformation and residual stresses. Diagrams, graphs, tables. 3 ref. (Q24, Q25)

926-Q. Behaviour in Pure Bending of Box Girders. J. C. Chapman. *Engineer,* v. 198, Aug. 20, 1954, p. 253-257.

Effect of buckling in webs without added complication of flange buckling. Diagrams, graphs. 3 ref. (Q5)

927-Q. Effect of Grinding on the Fatigue Strength of Steels. D. N.

Cledwyn-Davies. *Engineer,* v. 198, Aug. 20, 1954, p. 270-272.

Fatigue tests carried out in rotating-beam machine giving uniform bending moment. Limiting fatigue ratios determined on several alloy and carbon steels. Tables, diagrams. (Q7, G18, AY, CN)

928-Q. Notch Ductility of Nodular Irons. G. A. Sandoz, H. F. Bishop and W. S. Pellini. *Foundry,* v. 82, Sept. 1954, p. 114-119, 263-266.

Drop weight test data on 88 heats. Photographs, graphs, table. 3 ref. (Q23, CI)

929-Q. How Radiation Affects Structural Materials. I-II. C. R. Sutton and D. O. Leeser. *Iron Age,* v. 174, Aug. 19, 1954, p. 128-131; Aug. 26, 1954, p. 97-100.

Mechanical and physical properties of nearly all materials are changed. Data for various combinations of radiation level and temperature. Tables, diagrams, graphs. (Q general, P general)

930-Q. Creep-Rupture Characteristics of Al-Mg Solid-Solution Alloys. Arthur W. Mullendore and Nicholas J. Grant. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 973-979.

Alloys containing 0.94, 1.92 and 5.10% magnesium tested at 500, 700 and 900° F. Tables, graphs, micrographs. 13 ref. (Q3, Q4, Al)

931-Q. Influence of Oxygen and Nitrogen in Solution in Alpha Titanium on the Friction Coefficient of Copper on Titanium. W. R. Yankee and E. S. Machlin. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 989-990.

Solid solutions have markedly lower friction against softer metals than does pure titanium. Graphs. 6 ref. (Q9, Ti)

932-Q. Preferred Orientation of Cold-Rolled Uranium Foil. W. Seymour. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 999-1003.

Cold reduction by 90% resulted in duplex texture. Results compared with orientations of several hexagonal close-packed metals. Diagrams, tables. 20 ref. (Q24, U)

933-Q. Effects of Temperature on the Deformation of Beta Brass. Charles S. Barrett. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1003-1008.

Impact hardness tests from −200 to 600° C. Formation of deformation bands and absence of twinning. Micrographs, graphs. 19 ref. (Q24, Cu)

934-Q. Stress-Strain Characteristics and Slip-Band Formation in Metal Crystals: Effect of Crystal Orientation. F. D. Rosi. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1009-1020.

Plastic properties of silver and copper crystals during early stages of flow. Work hardening in terms of dislocation theory. Tables, graphs, diagrams, micrographs. 34 ref. (Q24, M26, Ag, Cu)

935-Q. Effect of Tempering on the Hardness of Retained Austenite. Philip Stark and B. S. Lement. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1074-1075.

Tests on high-purity iron alloy with 1.7% carbon indicate that apparent increase of hardness is due to formation of surface martensite during polishing. Graphs, micrograph. 4 ref. (Q29, J29, CN)

936-Q. Decrease of Density During Plastic Deformation of Nodular Cast Iron. W. R. Clough and M. E. Shank. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1093-1094.

Mechanical and physical properties of three heats of different compositions. Graph, tables, micrographs. 3 ref. (Q24, P10, CI)

937-Q. Magnesium Alloys for Elevated Temperature Applications. *Magnesium,* 1954, Aug. p. 13-16.

Mechanical properties of magnesium-zinc-rare earth alloys. Photograph, table, graphs. (Q general, Mg)

938-Q. Intercrystalline Brittleness in Beta Brass. L. E. Samuels and A. R. Bailey. *Metal Industry,* v. 85, Aug. 20, 1954, p. 143-144.

Improved polishing technique reveals brittleness is not due to any distinct phase present at grain boundaries. Micrographs. 12 ref. (Q23, M27, Cu)

939-Q. Comparative Investigation at Fluctuating Tension (R = 0) on Dural Lugs of Different Design. A. Hartman. *Netherlands National Luchtvaartlaboratorium Report M.* 1932, Oct. 1953, 21 p.

Results of fatigue tests. Tables, graphs, diagrams, photographs. (Q7, Al)

940-Q. Design for Fatigue. E. H. Spaulding. *SAE Transactions,* v. 62, 1954, p. 104-115; disc., p. 115-116.

Fatigue design of aircraft lower wing surfaces. Diagrams, graphs, photograph. 9 ref. (Q7)

941-Q. Measurement and Control of Residual Stresses in Cylinder-Block Castings. R. E. VanDeventer and Forest McFarland. *SAE Transactions,* v. 62, 1954, p. 280-287.

Effect of cooling rate and movement of trapped stresses. Methods giving quantitative results serve as good indices of stresses present in complex castings. Photographs, graphs, diagram. (Q25, CI)

942-Q. Service and Testing Observations of Fatigue Failure in Helicopter Components. Richard M. Carlson and F. David Schnebly. *SAE Transactions,* v. 62, 1954, p. 376-384.

Corrective measures taken in design, manufacturing and field errors. Photographs, graphs, micrographs. (Q7)

943-Q. Effect of Temperature on Endurance Limit and Relaxation of Spring Materials. F. P. Zimmerli and W. P. Wood. *SAE Transactions,* v. 62, 1954, p. 557-565.

Maximum stresses sustained and losses in load-carrying capacity above and below atmospheric temperatures. Photographs, graphs, tables. 4 ref. (Q7, Q3)

944-Q. Porcelain Enameled Aluminum: Light Weight, Good Workability for the Fabricator. *Steel,* v. 135, Sept. 6, 1954, p. 110-111.

Strength and corrosion resistance of various enameled aluminum products. Photographs. (Q23, R general, L27, Al)

945-Q. Mechanical Properties at Room Temperature of Four Cermets of Titanium Carbide With Nickel Binder. Aldie E. Johnson, Jr. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3197, Aug. 1954, 22 p.

Stress-strain curves for compression, tension and shear loadings. Table, photographs, diagrams graphs. 4 ref. (Q27 Q28 Q1, H general)

946-Q. Torsional Vibrations of Hollow Thin-Walled Cylindrical Beams. Edwin T. Kruszewski and Eldon E. Kordes. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3206, Aug. 1954, 33 p.

Differential equations and boundary conditions. Table, diagrams, graph. 2 ref. (Q1)

947-Q. A Nonlinear Theory of Bending and Buckling of Thin Elastic Shallow Spherical Shells. A. Kaplan and Y. C. Fung. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3212, Aug. 1954, 58 p.

Theoretical and experimental investigation of finite displacement. Tables, diagrams, graphs, photograph. 10 ref. (Q5, Q28)

948-Q. An Analysis of the Stability and Ultimate Bending Strength of Multiweb Beams With Formed-Channel Webs. Joseph W. Semonian and Roger A. Anderson. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3232, Aug. 1954, 28 p.

Design curves and procedures for calculating stresses for instability and failure. Photographs, diagrams, graphs. 9 ref. (Q5)

949-Q. (German and French.) **Does Stamp-Marking Weld Seams Impair Their Original Strength?** E. Brandenberger and C. Theiler. *Zeitschrift für Schweisstechnik,* v. 44, no. 8, Aug. 1954, p. 169-172.

Experiments show weld seams may be safely marked if left in the as-welded state, but not if worked on or machined. Photographs. (Q23, K9)

950-Q. (German.) **Processing of Silver-Copper Alloys.** H. Roters. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 601-602.

Effects of solid and gaseous inclusions on workability. Photographs. 4 ref. (Q23, Ag, Cu)

951-Q. (German.) **Creep Strength of Silver and Silver Alloys.** G. Reinacher. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 603-610.

Tests on five alloys at various temperatures and loads. Graphs, tables, micrographs, photograph. 14 ref. (Q3, Ag)

952-Q. (German.) **Electrical Contacts of Noble Metals.** A. Keil. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 611-614.

Wear resistance of metals and requirements of contact materials. Applications of various metals and alloys. Graphs, tables. 8 ref. (Q9, T1, EG-c, Cu, W, Mo)

953-Q. (German.) **Formation of Slip Lines on Plastically Deformed Metal Surfaces. IV.** Wilhelm Späth. *Metalloberfläche,* Ausgabe A, v. 8, no. 8, Aug. 1954, p. 113-117.

Constant magnitude of slip lines explained by formation of briefly viscous films and by shifting of zones adjoining these films due to relaxation. Heating effect along slip planes and effect of plastic deformation on the properties of the material. Photograph, diagram. 12 ref. (Q24)

954-Q. (German.) **Fractures of Crane Hooks and Ladle Hangers and Measures for Preventing Them.** Gerhard Will. *Stahl und Eisen,* v. 74, no. 17, Aug. 12, 1954, p. 1062-1069.

Fractures caused by age, reduced cross section, inexpert welding or heat treatment. Screens to protect hooks and suspensions from radiant heat proved highly successful. Photographs, tables, diagrams, graphs. 10 ref. (Q26, ST)

955-Q. (German.) **Distribution of Shift in Small Plastically Deformed Zones.** G. Leibfried. *Zeitschrift für angewandte Physik,* v. 6, no. 6, June 1954, p. 251-253.

Mathematical computation of shear stress of displacement ring in slip plane. Diagrams. 5 ref. (Q24, Q2)

956-Q. (Russian.) **Nature of Hardness of Tempered Steel.** G. V. Kurdiumov. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1254-1267.
Scattering and decrease of interference lines of untempered martensite. Fine crystalline structure of martensite of tempered steel. High resistance to plastic deformation. Table. 29 ref. (Q29, Q24, M26, ST)

957-Q. (Russian.) **Problem of Stress Condition of Surface Layer of Steel During Machining.** V. N. Timofeev. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1273-1281.
Mathematical treatment of residual stresses and analysis of cutting forces. Diagrams, graphs. 3 ref. (Q25, G17, ST)

958-Q. (Russian.) **A Class of Complex Loadings Which Is Characterized by Preservation of Directions of Main Axes.** V. V. Novozhilov. *Prikladnaia Matematika i Mekhanika,* v. 18, no. 4, July-Aug. 1954, p. 415-424.
Differential correlations between invariants of stress and strain. Formulas linking tensors. Graphs. 12 ref. (Q25)

959-Q. (Russian.) **Stress Beyond Elastic Limit in a Solid Rotating Cylinder.** A. G. Kostiuk. *Prikladnaia Matematika i Mekhanika,* v. 18, no. 4, July-Aug. 1954, p. 453-456.
Mathematical treatment. 2 ref. (Q25)

960-Q. (Russian.) **Deformation Texture of Pipes of Stainless and Heat-Resistant Steel.** Ts. N. Rafalovich. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1282-1287.
Orientation depends on sliding surfaces in crystal lattice, direction of metal flow and forces applied. Drawing and cold rolling compared. Diagrams. 3 ref. (Q24, ST)

961-Q. (Book.) **Aluminum Structural Design.** 129 p. 1951. Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.
Mechanical properties and fabricating considerations. Design data on special shapes.
(Q general, T26, Al)

962-Q. (Book.) **Principles of Experimental Stress Analysis.** M. B. Moore. 146 p. Prentice-Hall, Inc., 70 Fifth Ave., New York, N. Y. $4.00.
Uses and limitations; applications in prevention of failure in engineering structures and machines. (Q25)

963-Q. (Book.) **Solution of Problems in Strength of Materials.** S. A. Urry. 381 p. Sir Isaac Pitman & Sons, Ltd., Parker St., Kingsway, London, W.C.2, England. 20s.
Formulas and sample calculations of stress, strain, elasticity, shearing force, bending moment, torsion, deflection, beams and struts, thin and thick cylindrical shells, strain energy, and springs. (Q23)

R

Corrosion

365-R. Corrosion Is a Major Cause of Wear in Engine Cylinders. Oscar W. Wuerz. *Automotive Industries,* v. 111, Aug. 1, 1954, p. 60-61.
Additive-type oil results in saving in labor, material and lost revenue time. Graphs, table. (R7, Q9)

366-R. Borax Solutions Found to Inhibit Rusting. Fred W. Blaisdell. *Civil Engineering,* v. 24, Aug. 1954, p. 537-538.
Effects on specific gravity, surface tension and kinematic viscosity of water can be neglected in ordinary hydraulic laboratory work. Graphs. (R10, ST, Zn)

367-R. Comparisons of Cathodic Protection Test Methods. Kirk H. Logan. *Corrosion,* v. 10, July 1954, p. 206-210; disc., p. 211.
Four methods compared in three soil types. Graphs. 8 ref. (R10, CN)

368-R. Some Experiences With Cathodic Protection in Chicago. L. M. Plym. *Corrosion,* v. 10, July 1954, p. 213-214.
Protection for lead-sheathed telephone cables. Table, diagram. (R10, Pb)

369-R. Chromate for Corrosion Control in Methanol Antifreeze. George E. Best and Eugene A. Roche. *Corrosion,* v. 10, July 1954, p. 217-223; disc., p. 223.
Two-year study shows that 5000 p.p.m. of Na_2CrO_4 is adequate inhibitor. Photographs, tables. 22 ref. (R10)

370-R. Industrial Applications of a Method for Measuring Small Amounts of Corrosion Without Removal of Corrosion Products. Andrew Dravnieks and Horace A. Cataldi. *Corrosion,* v. 10, July 1954, p. 224-230.
A simple, electrical resistance method. Diagrams, graphs, table. 13 ref. (R11)

371-R. High Temperature Oxidation Characteristics of Some Manganese-Aluminium Steels. I. A. A. Krishnan and Ved Prakash. *Journal of Scientific & Industrial Research,* v. 13, sec. B, June 1954, p. 444-449.
Oxidation characteristics obey parabolic law at 600 to 700° C. Effects of manganese and aluminum additions. Graphs, tables, micrographs. 6 ref. (R2)

372-R. Wear and Corrosion of Materials in High Temperature Water. R. C. Westphal and J. Glatter. *Materials & Methods,* v. 40, Aug. 1954, p. 100-101.
How a wide range of corrosion resistant materials will stand up under the unusual bearing conditions encountered in nuclear power plants. Photograph, table. (R4, Q9)

373-R. Corrosion of Pump Parts. Edward H. Huss. *Metal Progress,* v. 66, Aug. 1954, p. 100-102.
Dynamic corrosion tests on nickel alloys, stainless steels and other metals. Diagrams, photograph, table. (R11, SS, Ni, SG-g)

374-R. Sleeve-Bearing Alloys Susceptible to Cavitation Damage. (Digest of "The Resistance of Some Cast and Plated Sleeve-Bearing Materials to Cavitation Erosion", by R. A. Schaefer, J. F. Cerness and H. A. Thomas; *Transactions of the Institute of Metal Finishing,* 1954.) *Metal Progress,* v. 66, Aug. 1954, p. 170, 172.
Tests to determine the extent and probability of cavitation damage to tin-base and lead-base babbitts with and without antimony additions, Cu-Pb, Cu-Pb-Sn, Cd-Ni, Al-Sn-Cu-Ni, as well as samples of pure lead, silver, copper, and tin. (R2, SG-c)

375-R. (English.) **How the Addition of Metals Affects Sulphurization-Resistant Property of Cast Iron at High Temperature.** Masakazu Shiozawa and Hiroshi Nakai. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 11-13.
Effect of aluminum, manganese, molybdenum and silicon on resistance of cast iron to fumes containing sulfur compounds. Tables, graph, diagram. (R6, CI)

376-R. (English.) **Electron Diffraction Studies on the Nature of the Corrosion and Heat Resistances of Titanium.** Tadayuki Nakayama. *Castings Research Laboratory, Report, Waseda University,* 1954, no. 5, p. 57-59.
Studies of the protective film formed on the surface of titanium on exposure to salt water. Tables, diagram, photograph. 4 ref. (R4, R11, M22, Ti)

377-R. (French.) **Titanium and Corrosion.** C. More. *Métallurgie et la construction mécanique,* v. 86, nos. 7-8, July-Aug. 1954, p. 581-582.
Corrosion resistance properties of titanium and its alloys. 5 ref. (R general, Ti)

378-R. Where to Place the Reference Electrode on a Pipeline. Leon P. Sudrabin and Joseph A. Lehmann. *American Gas Journal,* v. 181, Aug. 1954, p. 16-17, 35.
Subsurface potential calculations to establish effectiveness of cathodic protection. Diagrams. 4 ref. (R10, ST)

379-R. The Performance of Aluminium in Ships. D. C. G. Lees. *Chemistry & Industry,* 1954, no. 31, July 31, p. 949-955.
Examples. Corrosion and protective anodes and joints and protective treatments. Photographs, diagrams. 7 ref. (R10, T23, Al)

380-R. Corrosion Control on a Products Pipeline. *Canadian Metals,* v. 17, Aug. 1954, p. 16, 18.
Experience and practical aspects of cathodic protection. (R10)

381-R. Prevention of Water Corrosion in Mining Operations. Peter W. Sherwood. *Canadian Mining Journal,* v. 75, Aug. 1954, p. 72-75.
Six methods of reducing corrosive action suggested. (R4)

382-R. (Russian.) **Contact Corrosion of Magnetic Alloys and Protection by Metallic and Oxide Coatings.** A. V. Shreider. *Zhurnal Prikladnoi Khimii,* v. 27, no. 7, July 1954, p. 735-756.
Corrosive media. Chemical composition of alloys. Macro-cathode materials. Corrosion tests. Technology of coatings and platings; comparative results. Tables, graphs, diagrams, photographs. 16 ref. (R general, L general, SG-n)

383-R. Stress Corrosion in High Tensile Wire. W. O. Everling. *American Iron and Steel Institute, Preprint,* 1954, 19 p.
Tests on high-carbon wire for use in prestressed concrete. Oil tempered wire was more sensitive than hard drawn. Photographs, tables, graphs, diagrams, micrographs. (R1, CN)

384-R. Stress Corrosion in Stainless Steel. R. A. Lincoln. *American Iron and Steel Institute, Preprint,* 1954, 9 p.
Causes, tests and prevention of service failures. 8 ref. (R1, SS)

385-R. Testing of Materials for Naval Shipboard Sea Water Carrying Systems—A Review. J. W. Jenkins and J. B. Guerry. *American Society of Naval Engineers, Journal,* v. 66, Aug. 1954, p. 607-639.
Corrosion tests of various metals and alloys in pipes, valves, pumps and other equipment. Photographs, diagram, tables. 5 ref. (R11, R4)

386-R. Valves to Combat Corrosion. *Chemical Engineering,* v. 61, Sept. 1954, p. 198-204.
Results from "valve clinics" held in seven industrial centers. (R general)

387-R. High-Silicon Cast Iron Tested for Use With Impressed Currents. Walter A. Luce. *Corrosion,* v. 10, Sept. 1954, p. 267-268.
Tests show 14.5 silicon iron satisfactory for anodes in cathodic protection systems. Photographs, tables. (R10, CI)

388-R. Pitting Corrosion Characteristics of Aluminum—Influence of Iron and Silicon. P. M. Aziz and Hugh P. Godard. *Corrosion,* v. 10, Sept. 1954, p. 269-272.

Addition of iron or silicon increases pitting probability and pitting rate of super purity aluminum. No significant increases noted for commercial grades. Tables, graphs. 3 ref. (R2, Al)

389-R. Relation of Corrosion to Business Costs. Aaron Wachter. *Corrosion,* v. 10, Sept. 1954, p. 273-278.

Direct and indirect effects of corrosion on costs of operating a business. Diagram. 6 ref. (R general, A4)

390-R. Corrosion of Bronze Oil-Sealing Sleeves in Centrifugal Gas Compressors. Edward C. Greco. *Corrosion,* v. 10, Sept. 1954, p. 279-283.

Tests show dust from gas pipe line caused corrosion of bronze but had no effect on steel, aluminum, Monel, Inconel, nickel or cast iron. Tables, graphs, photographs. 3 ref. (R9, Cu, CN, Al, Ni, CI)

391-R. Corrosion Control in Gas Lift Wells. II. Evaluation of Inhibitors. D. A. Shock and J. D. Sudbury. *Corrosion,* v. 10, Sept. 1954, p. 289-294.

Corrosion inhibitors for use in wells producing corrosive water. Photographs, graphs, tables, micrographs. 8 ref. (R10, CN)

392-R. Oxidation of Plain, Alloyed and Ductile Irons at 1300 Degrees F. J. A. Cameron. *Corrosion,* v. 10, Sept. 1954, p. 295-297; disc., p. 297-298.

Tests up to 4000 hr. show ductile iron to be more resistant than flake graphite irons. Diagram, tables, graphs. (R2, CI)

393-R. Pipe-Type Cable Corrosion Protection Practices in the Utilities Industry. *Corrosion,* v. 10, Sept. 1954, p. 299-313.

Data compiled from field practices of 17 operators. Materials, coatings, testing and related information. Tables. (R10, CN)

394-R. Scale Formation and Corrosion Cracking in Heat-Resisting Alloys for Gas Turbines. P. Galmiche. *Engineers' Digest,* v. 15, Aug. 1954, p. 323-325. (From *La Recherche Aéronautique,* 1954, no. 39, May-June, p. 45-53.)

Previously abstracted from original. See item 335-R, 1954. (R2, R3, SG-h)

395-R. Electron Optical Study of Oxidation of High Purity Iron at Low Oxygen Pressures. Earl A. Gulbransen, William R. McMillan and Kenneth F. Andrew. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1027-1035.

Oxidation occurs discontinuously over the surface and orients with substructure of the metal grains. Tables, micrographs, diffraction pattern, diagram. 13 ref. (R2, M27, Fe)

396-R. High Pressure Oxidation of Metals: Tantalum in Oxygen. Robert C. Peterson, W. Martin Fassell, Jr., and Milton E. Wadsworth. *Journal of Metals,* v. 6, Sept. 1954; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Sept. 1954, p. 1038-1044.

Temperature and pressure dependence from 500 to 1000° C. at 10 mm. Hg to 600 psi. oxygen pressure. Photograph, diagrams, graphs, tables. 13 ref. (R2, Ta)

397-R. Corrosion Control and Prevention. L. R. Honnaker. *Paint Industry Magazine,* v. 69, Aug. 1954, 42, 44-47.

Covers types of corrosion, use of plastics, rubber liners and coatings. (R general, L general)

398-R. Why Cars Corrode. *Railway Locomotives and Cars,* v. 128, Sept. 1954, p. 63-65.

Corrosion, causes and prevention, in tank and refrigeration cars. (R1, R10)

399-R. Stress Corrosion of 12% Cr Stainless Steel. W. L. Badger. *SAE Transactions,* v. 62, 1954, p. 307-310; disc., p. 310-313.

Compressor rotor blade cracking eliminated by stress relief at 950° F. Superior performances shown by use of three alloys over type 403. Graphs, photographs, tables, micrographs, diagram. 1 ref. (R1, J1, SS)

400-R. (Italian.) Phenomena of Passivity of Metals and Alloys. R. Piontelli. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 5-28.

Theoretical study. Tables, charts. 9 ref. (R10)

401-R. (Italian.) Passivity of Zinc in Relation to Conditions of Aeration. G. Bianchi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 29-30; disc., p. 30.

Zinc in a solution of sodium chloride considered in study of corrosion by galvanic macroelements. Charts. (R10, Zn)

402-R. (Italian.) Aspects of the Influence of Oxygen in Wet Corrosion Phenomena. G. Bianchi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 30-31; disc., p. 32.

Overvoltage of cathodic reduction and diffusion of oxygen. Charts. (R10)

403-R. (Italian.) Passivity Phenomena in Stainless Steels. A. Ferri. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 33.

Measurement of electrochemical potential in 1*N* sulfuric acid, at 30° C., of 18-8 stainless steel. Tables. 2 ref. (R10, SS)

404-R. (Italian.) Passive States Produced by Oxidizing Agents on Common and Special Steels. A. Indelli. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 34-35.

Study of action of chromates and nitrites on anodic and cathodic reactions. 14 ref. (R10, ST)

405-R. (Italian.) Use of Metallic Materials and Corrosion in the Chemical Industry. G. Pastonesi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 37-41; disc., p. 41.

Applications of nickel-base alloys, weld deposited alloys and other nonferrous materials. Corrosion phenomena in the chemical industry. (R general, T29, Ni, SS, Al)

406-R. (Italian.) Influence of Liberated Gases on the Pitting of Stainless Steels. C. Bighi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 42-43.

Theoretical study. Table, diagram. 9 ref. (R2, SS)

407-R. (Italian.) Method of Estimating the Local Corrosion Current on Zirconium. M. Maraghini and P. Van Rysselberghe. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 45-46.

Method uses artificial separation of the anodic and cathodic zones. Diagrams. 4 ref. (R11, Zr)

408-R. (Italian.) Some Problems of Corrosion and Means of Combatting It in a Petroleum Refinery. P. Daino. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 47-50; disc., p. 50.

Main causes of corrosion and defense against it by use of alkaline neutralizers, inhibitors, alloy and special steels, protective coatings and cathodic protection. Photographs. 5 ref. (R1, R10, L general, ST)

409-R. (Italian.) Drinking Water and Its Corrosive Action on Ferrous Materials. R. Sandrinelli. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 54-58; disc., p. 58.

Precautions to be taken by manufacturers of water pipe lines and mains to prevent corrosion. Charts. 12 ref. (R4, CI, ST)

410-R. (Italian.) Anticorrosive Protection by Means of Substances Having an Inhibiting Action. L. Cavallaro. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 59-63; disc., p. 63.

Industrial applications of several inhibitors. (R10)

411-R. (Italian.) Contribution to the Study of Inorganic Inhibitors. U. Bertocci. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 64-65; disc., p. 65-66.

Influence of arsenic, antimony and tin on the attack of metals of the iron group by hydrochloric acid solutions. Charts. 12 ref. (R10, R5, Fe, Co, Ni)

412-R. (Italian.) Use of Inhibitors in the Chemical Cleaning of Boilers. B. Domenicali. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 69; disc., p. 69, 88.

Method consists in use of a dilute hydrochloric acid solution (max. concentration 5%), inhibited with one unit of inhibitor per liter. (R10, ST)

413-R. (Italian.) Research on Vapor Phase Inhibitors. G. Mantovani. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 75-76.

Protection of metallic structures with substances volatizing at room temperature. Tables, photographs. 10 ref. (R10, ST)

414-R. (Italian.) Corrosion and Protection of Underground Metallic Materials. M. Jacopetti. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 79-87; disc., p. 88.

Causes and prevention of corrosion in pipes, conduits and tubes, and recent research in this field. 65 ref. (R8, ST)

415-R. (Italian.) Inquiry Into Some Cases of Corrosion in Radiant-Panel Heating Pipes. E. Donati and G. Beretta. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 91-95; disc., p. 95.

Seven cases of corrosion and remedies. Photographs. 9 ref. (R3, ST)

416-R. (Italian.) Cathodic Protection of Undeground Metallic Cables and Structures. E. Gerosa. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 96-97; disc., p. 97.

Cathodic protection by reactive anodes, polarized drainage and impressed e.m.f. (R10)

417-R. (Italian.) Economic Aspects of Cathodic Protection. T. Nanni and A. Compostella. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 98-100.

Economic advantages of cathodic protection. Table. 6 ref. (R10)

418-R. (Italian.) Contribution to the Study of Hot Oxidation of Metals and Alloys. F. De Carli and P. Spinedi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 101-107; disc., p. 107.

Tests on iron, copper, titanium, copper-tin and copper-aluminum. Effects of allotropic modifications, stability of oxides, composition of oxidized layers and composition of alloys. Diagrams. 18 ref. (R2, Fe, Cu, Ti, Sn, Al)

419-R. (Italian.) Methods of Testing and Checking in the Field of Metal Corrosion. G. Bianchi. *Metallurgia italiana,* v. 46, special supplement to no. 5, May 1954, p. 109-112.

Testing by immersion in static solutions, immersion in agitated and aerated solutions, saline fog and by alternating immersion. 2 ref. (R11)

420-R. (Italian.) Methods of Testing the Action of Pigments in Varnishes. C. Bighi and G. Mantovani. *Metallur-*

gia italiana, v. 46, special supplement to no. 5, May 1954, p. 117-118.

Microamperometer, electrolytic cell, liquid attack, and industrial corrosive atmosphere tests. Photograph. 7 ref. (R11, L26)

421-R. (Italian.) **Estimating Inhibiting Power by Means of Polarization Curves.** G. Bombara. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 119-120.

Advantages of method. 1 ref. (R10)

422-R. (Italian.) **Use of Electrochemical Methods in the Testing of Materials.** L. Cavallaro and A. Indelli. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 120-121.

Disadvantages of electrochemical testing of corrosive properties. 15 ref. (R11)

423-R. (Italian.) **Methods of Corrosion Testing at the Istituto Sperimentale dei Metalli Leggeri.** G. Luft. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 122-124; disc., p. 124.

Eight methods used for estimating the corrosion resistance of aluminum alloys. Photographs, diagrams. 12 ref. (R11, Al)

424-R. (Italian.) **Analyses of Metallic Sound as a Measurement of Intercrystalline Corrosion in 18-8 Stainless Steel.** O. Masi and A. Ferri. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 125-127; disc., p. 128, 140.

Theory, techniques and applications. Tables, photographs, graphs. (R2, SS)

425-R. (Italian.) **Continuous Polarographic Investigation of the Kinetics of Corrosion.** L. Riccoboni, P. Papoff, and V. Genta. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 129; disc., p. 144.

Equipment and techniques. (R11)

426-R. (Italian.) **Research and Information Services Available in the Fight Against Corrosion.** M. Pourbaix. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 136-140; disc., p. 140.

Research work and organization of the Belgian Center of Corrosion Study. 13 ref. (R general, A9)

427-R. (Italian.) **Italian Standardization in the Field of "Corrosion of Metallic Materials".** *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 141.

General program. (R general, S22)

428-R. (Italian.) **Corrosion Committee of the Societa Montecatini and Some Problems it Has Solved.** E. Hugony. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 145-146.

Research on alumnium cans for hydrogen peroxide, cooling-water pipes for coolers and lead-antimony valves for phosphorus chloride or oxychloride plants. Photographs, diagrams. (R11, Al, Pb, Sb)

429-R. (Italian.) **Organization and Activity of Research and Testing in the Field of Corrosion at the Breda Istituto di Ricerche Scientifiche Applicate all'Industria.** L. Matteoli. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 147-148.

Current activity. 31 ref. (R11, A9)

430-R. (Italian.) **Research Center for the Marine Corrosion of Metals.** M. Raffo. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 149-150.

Work over period from Apr. 1951 to June 1953. (R4, A9)

431-R. (Italian.) **Nickel Information Centers. Their Activity in the Fight Against Corrosion.** C. Galletto. *Metallurgia italiana*, v. 46, special supplement to no. 5, May 1954, p. 151.

Program in such centers throughout the world. (R general, A9, Ni)

432-R. (German.) **How Do the Mysterious Grooves on Railroad Rails Arise?** Max Fink. *Umschau in Wissenschaft und Technik*, v. 54, no. 16, Aug. 15, 1954, p. 499-502.

Experiments show that grooves and waves on rail surfaces are caused by work hardening effect of the rolling-and-gliding wheels. This increases chemical activity of steel, and hence its oxidation. Photographs. 7 ref. (R2, CN)

433-R. (German.) **The Reading Accuracy in Measuring Corrosion and Thickness With Ultrasonic Impulses.** A. Lutsch. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 96, no. 23, Aug. 11, 1954, p. 773-777.

Use of the ultrasonic reflectoscope for detecting and measuring small and large areas of corrosion on inaccessible places and for measuring the thickness of sheet metal. Tables, diagrams. 6 ref. (R11, S14)

434-R. (Russian.) **Electrochemical Investigation of Passivated Iron.** L. V. Vaniukova and B. N. Kabanov. *Zhurnal Fizicheskoi Khimii*, v. 28, no. 6, June 1954, p. 1025-1035.

Electrode potential and quantity of electricity. Polarization curves and measurements of electrode capacitance. Fast and slow anodal processes of oxidation. Effect of chlorine on oxidation. Tables, graphs, diagram. 22 ref. (R10, Fe)

435-R. (Book.) **Bibliographic Survey of Corrosion 1948-1949.** Publication No. 54-1. 346 p. 1954. National Association of Corrosion Engineers, 1061 M & M Building, Houston 2, Texas. Members $10.00, nonmembers $12.50.

Compilation of 3500 abstracts from some 500 periodicals and books by over 30 abstracting agencies. (R general, A10)

436-R. (Pamphlet.) **Corrosion Control for Screwjack Materials.** Wright Air Development Center. Report no. PB111318. 1951. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $1.00.

Evaluation of 18 protective coatings to replace oils. (R10, L general, ST)

437-R. (Book.) **Corrosion Data Survey.** G. A. Nelson. 1954. Shell Development Co., Emeryville, Calif. $35.00.

Summarizes data so that feasible metals for construction of different types of equipment may be easily chosen. (R general)

S

Inspection and Control

311-S. Photographic Pyrometry. J. W. Londeree, Jr. *American Ceramic Society, Journal*, v. 37, Aug. 1954, p. 354-360.

Method whose speed is limited only by the exposure time required to obtain an image on a photographic film. Graphs, photographs, table. 4 ref. (S16)

312-S. Controlling Product Quality. *Battelle Technical Review*, v. 3, Aug. 1954, p. 83-84.

Nondestructive testing by industry controls quality and lowers production costs. (S12)

313-S. Practical Foundry Application of Radioisotopes. V. G. Behal. *Canadian Metals*, v. 17, July 1954, p. 22-23.

Gamma-camera with iridium^{192} source used for inspection of steel castings. Diagrams, radiograph. (S13, CI)

314-S. A.I.S.I. Standard Boron Steel Compositions. Openhearth and Electric Furnace Alloy Steels. *Metal Progress*, v. 66, Aug. 1954, p. 112-B.

Data sheet, revision of Feb. 1954. (S22, AY)

315-S. Autoradiographic Studies of Surface Detail With Chromium-51. L. E. Preuss. *Nucleonics*, v. 12, Aug. 1954, p. 30-32.

Unique approach combines methods of vacuum evaporation, shadow casting and autoradiography. Diagrams, photographs, table. 36 ref. (S15)

316-S. Why Parts Fail. J. A. Bennett and G. W. Quick. *Product Engineering*, v. 25, Aug. 1954, p. 129-134.

Precautions to consider in design, fabrication and use of metal parts in reducing service failures. Photographs. 7 ref. (S21)

317-S. Radioisotopes in Industrial Control. G. D. Calkins and Meyer Pobereskin. Paper from "Nuclear Engineering. Pt. I.". American Institute of Chemical Engineers, p. 259-266.

Utilization of radioactive techniques in the measurement of location motion, measurement of physical properties, detection of flaws, tracing of materials, and determination of chemical composition. 39 ref. (S19)

318-S. Quality Control in the Manufacture of Zinc. Technique of Approximating a 3-Variable Problem Solution. Harold L. Springer. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 1-14.

Clarifies concept of multivariate regression. Relation of concept of multivariate regression to analysis of control chart data. Diagrams, tables. (S12, Zn)

319-S. Ultrasonics — Theory and Practice. W. C. Hitt. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 57-66.

Survey of equipment and methods for ultrasonic flaw detection. Diagrams, photographs. (S13)

320-S. Quality Control in the Manufacture of Miniature Precision Bearings. Charles J. Hudson. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 93-100.

Equipment, records and procedures. Diagrams, graphs, table. (S12)

321-S. Foundry Quality Control for Short Runs. Allin P. Deacon. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 185-198.

Core, sand and cupola control. Detection of defects in castings. Diagrams, tables, photographs. (S12, E general)

322-S. Quality Control at Warner Gear. Francis E. Jolliffe. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 229-239.

Statistical quality control of machining operations. (S12, G17)

323-S. Quality Control of Tubular Steel Products. W. T. Rogers. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 289-302.

Procedures employed by Lorain Works, National Tube Division, U. S. Steel Corp. Graphs, charts. 7 ref. (S12, F26)

324-S. Statistical Design of Experiments in Metallurgical Research. S. Gilbert. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 445-455.

Analysis of variables and fractional replicate design. Tables. 9 ref. (S12)

325-S. A Survey of the Use of Statistical Methods by A.S.Q.C. Members in the Metals Industry. Paper from "Quality Control Convention Papers". American Society for Quality Control, p. 579-616.

Presentation and analysis of data from replies to questionnaires. Types of quality control and sampling methods, charts and reports used. Tables, diagrams. (S12)

326-S. (English.) An Automatically Recording Magnetic Balance. Tokutaro Hirone, Seijiro Maeda and Noboru Tsuya. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 6, no. 1, Feb. 1954, p. 67-76.

Construction and applications of device for plotting magnetization-temperature curves. Photographs, diagrams, graphs. (S16, P16)

327-S. (Russian.) Characteristics of Accelerated Testing of Machine Durability and Distribution of Test Results. R. V. Kugel'. *Vestnik Mashinostroenia,* v. 34, no. 5, May 1954, p. 3-9.

Analysis of factors causing distortion of data obtained under forced tests. Diagrams, micrographs. 7 ref. (S12)

328-S. Why Did It Fail? M. V. Herasimchuk. *American Foundrymen's Society, Preprint no.* 54-58, 1954, 7 p.

Procedure whereby equipment failures can be quickly classified as design problems or metallurgical problems. Graph, photographs. (S21, AY)

329-S. Reference Book Sheets. Limits and Fits for Cylindrical Parts, VII-IX. *American Machinist,* v. 98, Aug. 16, 1954, p. 151, 153, 155.

Interference locational, force and shrink fits. Tables, diagrams. (To be continued.) (S22, K13)

330-S. Technical Features of the New British Standard System of Limits and Fits. H. G. Conway. *Institution of Mechanical Engineers, Proceedings,* v. 168, no. 8, 1954, p. 233-245.

Derivation of tolerances, review of problems of metrology, possible future extensions of system. Diagrams, tables, graphs. (S22, K13)

331-S. Tool and Gage Inspection. Michael C. Curtis. *Instruments and Automation,* v. 27, Aug. 1954, p. 1314-1316.

General foreman of a large tool-inspection department reports on the instruments, personnel and functions of his department. Photographs. (S14)

332-S. Nondestructive Tests Check Forging Quality, Spot Equipment Troubles. S. C. Totaro. *Iron Age,* v. 174, Aug. 12, 1954, p. 117-119.

Frequent magnetic particle inspections during the forging process pay off by nipping costly troubles in a hurry. Photographs. (S13, F22, CN)

333-S. A Surface-Scanning Pyrometer. R. B. Sims and J. A. Place. *Journal of Scientific Instruments,* v. 31, Aug. 1954, p. 293-294.

Instrument designed to measure at high speed the distribution of temperature over a body too hot for contact methods. Diagram, graphs. (S16)

334-S. Measurement of Plane Surface Finish by Photometry. Jean M. Péters. *Microtecnic* (English Ed.), v. 8, no. 3, 1954, p. 119-125; disc., p. 125-126.

Based on comparative deflection of reflected light. Diagrams, graphs, tables. (S15)

335-S. The Necessity and the Conditions for Producing Internationally Comparable Rockwell-C Hardness Values. K. Meyer. *Microtecnic* (English Ed.), v. 8, no. 3, 1954, p. 138-148.

Reviews problems and equipment. Photographs, graphs, diagram. (S22, Q29)

336-S. Ultrasonic Test for Bonding Flaws. *Steel,* v. 135, Aug. 23, 1954, p. 102-103.

New method of inspection permits sound waves to detect lack of bond in terms of thickness measurement. Diagrams. (S13, S14)

337-S. Statistical Quality Control Techniques Offer Cost Savings. D. D. Pettit. *Western Metals,* v. 12, Aug. 1954, p. 49-51.

Management, product and tool engineering, and manufacturing personnel jointly exercise the function of controlling quality of a product. Charts. (S12)

338-S. Absorption of Ultrasonic Waves by Single Crystals. S. Y. Sokolov. *Henry Brutcher, Altadena, Calif., Translation no.* 3004, 6 p. (From *Znurnal Tekhnicheskoi Fiziki,* v. 19, no. 2, 1949, p. 274-278.)

Usefulness for detection of crystalline flaws. Oscillograms. 2 ref. (S13)

339-S. Effect of Heat Treating Upon the Results of Spectroanalysis of Steel and Welds. E. S. Kudelya. *Henry Brutcher, Altadena, Calif., Translation no.* 3272, 12 p. (From *Avtomaticheskaya Svarka,* v. 6, no. 1, 1953, p. 27-33.)

Effect of heat treatments of joints and steel on spectro-analysis. Tables, radiographs. 11 ref. (S11, J general, ST)

340-S. Quantitative Flaw Detection in Metals by the Slip-Over Coil. F. Förster and H. Breitfeld. **Theoretical Principles of Contactless Determination of Thickness and Conductance of Metallic Coatings, Foils, and Sheet.** F. Förster. (Parts V-VI of "Theoretical and Experimental Principles of Nondestructive Testing by Eddy Current Method".) *Henry Brutcher, Altadena, Calif., Translation no.* 3329 and 3292, 20 p. (Condensed from *Zeitschrift für Metallkunde,* v. 45, no. 4, 1954, p. 183-193, 197-199.)

Previously abstracted from original. See item 167-S, 1954. (S13, S14)

341-S. (German.) Photometric Determination of Bismuth With Thiourea. I. Performance in Nitric Acid Solution. Walter Nielsch and Gerhard Böltz. *Zeitschrift für analytische Chemie,* v. 142, no. 5, 1954, p. 321-329.

Methods for determining bismuth. Graphs, tables, ultra-violet spectra. 30 ref. (S11, Bi)

342-S. (German.) A New Photometric Method of Determining Cobalt With Nitrilotriacetic Acid. Walter Nielsch and Gerhard Böltz. *Zeitschrift für analytische Chemie,* v. 142, no. 5, 1954, p. 329-334.

Includes graphs, tables. 2 ref. (S11, Co)

343-S. (German.) A Simple Instrument for Sorting Mixed Materials by Magnetic Induction. Kurt Matthaes. *Zeitschrift für Metallkunde,* v. 45, no. 7, July 1954, p. 428-429.

Simple, rapid method of sorting steels. Circuit diagram, table. (S10, ST)

344-S. Practical Inspection of Mine Gear. R. Jeffrey. *Colliery Guardian,* v. 189, Aug. 12, 1954, p. 191-196.

Methods applicable are fluorescent, magnetic-particle, and ultrasonic detection and radiography. Tables. (S13)

345-S. Foundry Data Sheet. *Foundry,* v. 82, Sept. 1954, p. 151-152.

ASTM tentative specifications for automotive gray iron castings. (S22, CI)

346-S. Sampling Plans Reduce Inspection Time. Martin H. Saltz. *Tool Engineer,* v. 33, Sept. 1954, p. 45-50.

Characteristics of sampling by attributes or by variables. Photograph, graph, tables. 4 ref. (S12)

347-S. (German.) The Service Life of PtRh Thermocouples. H. Ehringer. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 596-598.

Effects of impurities, time, temperature and atmosphere. Graphs. 7 ref. (S16, Pt, Rh)

348-S. (German.) A Highly Sensitive and Wide-Range Magnetic Induction Thickness Meter. R. Berthold. *Metalloberfläche,* Ausgabe A, v. 8, no. 8, Aug. 1954, p. 117-119.

Device measures nonmagnetic films on a ferromagnetic base. Diagram, table, graphs, photograph. 1 ref. (S14)

349-S. (Russian.) Experimental Investigation of Topography of Magnetic Field From Natural Surface Defects in Ferromagnetic Bodies. N. N. Zatsepin. *Zhurnal Tekhnicheskoi Fiziki,* v. 24, no. 7, July 1954, p. 1224-1228.

Measuring apparatus utilizes relation of electric resistance of bismuth to magnetic field. Diagrams, graphs, micrographs. 4 ref. (S14, P15, P16, Fe, Bi)

350-S. (Pamphlet.) The Aluminum Association Alloy Designation System for Wrought Aluminum. Effective Oct. 1, 1954, 4 p. July 1954. The Aluminum Association, 420 Lexington Ave., New York 17, N. Y.

Four-digit index system. Conversion tables indicating new designations for old nomenclature. (S22, Al)

351-S. (Book.) Quality Control. N. L. Enrick. Ed. 2. 181 p. 1954. Industrial Press, 148 Lafayette St., New York 13, N. Y. $4.00.

Ready-made sampling plans, sample control charts, compressed limit gages, basis of proper specifications. New Part II covers additional control charts for variables, control charts for variance and for acceptance inspection, and analysis of variance. (S12)

352-S. (Book.) Quality Control Convention Papers. Edward M. Schrock, editor. (Eighth Annual Convention.) 648 p. 1954. American Society for Quality Control, 70 East 45th St., New York 17, N. Y. $3.50.

Sixty papers, separately abstracted, delivered at the 1954 annual convention. Statistical methods, apparatus, and techniques for control of quality in manufacturing operations and in business forecasting. (S12)

T

Applications of Metals in Equipment

259-T. Structural Trends. The Use of Steel and Titanium-Alloy Extruded Shapes in Modern Aircraft. Keith A. Wilhelm. *Aircraft Production,* v. 16, Aug. 1954, p. 301-303.

Properties, hot extrusion, applications and needs for further study of high-heat steel and titanium alloys. Graphs, diagram. (T24, AY, Ti)

260-T. Case History Application of Aluminum Screw Machine Products. Theodore Chanoux. *Electrical Manufacturing,* v. 54, Aug. 1954, p. 86-88.

Aluminum alloy rod substituted for stainless steel, alloy steel and brass in a dictating machine. Photographs. 14 ref. (T10, Al, SS, AY, Cu)

261-T. Germanium—New Frontier for High Power Rectification. C. E. Hamann. *Product Engineering,* v. 25,

Aug. 1954, p. 188-192.
Initial applications demonstrate significant advantages in higher cell ratings, lower losses, longer life, higher efficiency and marked cell size reduction. Photographs, graphs, diagrams. (T1, Ge)

262-T. (French.) **Germanium Semiconductors and Transistors.** C. Weill. *DOCAERO; revue documentaire de la technique aéronautique mondiale,* 1954, no. 28, p. 39-60.
Possible applications in aeronautical equipment. Diagrams, graphs, table, photographs. 20 ref. (T24, Ge)

263-T. Design and Manufacture of Track Layouts. IV. Docks and Works Sidings. T. Samson. *Edgar Allen News,* v. 33, Aug. 1954, p. 177-178.
Casting, heat treating and manufacture from steel strip. Photographs. (T22, T4, AY)

264-T. New Metals in Engineering. L. B. Pfeil. *Institute of Marine Engineers, Transactions,* v. 66, July 1954, p. 169-174 + 4 plates; disc., p. 175-181.
Metallurgical developments which bear on marine engineering. Properties and applications. Diagrams, tables, graphs, photographs, micrographs. 16 ref. (T22, Cu, Ni, CI, SG-h)

265-T. Custom Truck Bodies. Aluminum Makes Its Move. Robert E. S. Thompson. *Steel,* v. 135, Aug. 23, 1954, p. 100-101.
Advantages of aluminum; production sequence. Photographs. (T21, Al)

266-T. (Czech.) **Replacement of Nonferrous Metals by Nonmagnetic Steels.** Vl. Koran. *Slévarenstvi,* v. 2, no. 6, June 1954, p. 173-174.
Castability, machinability, weldability and impact strength are cited as advantages for many applications. Diagrams. (T general, SS)

267-T. (French.) **The Various Fields of Application.** *Revue de l'Aluminium,* v. 31, no. 211, June 1954, p. 201-272.
Uses of aluminum and its alloys in various industries. Photographs, drawings. (T general, Al)

268-T. Rock-Drilling With Hard Metals. III. E. J. Sandford and J. R. Wiles. *Alloy Metals Review,* v. 8, Sept. 1954, p. 2-8.
Manufacture, design and application of the hard metal tipped rock-drill. Photographs. 7 ref. (T7, EG-d)

269-T. Magnesium in Intercontinental Defense. *Magnesium,* 1954, Aug., p. 2-4.
Applications in guided missiles, communication equipment, and mobile units. Photographs. (T2, T1, Mg)

270-T. Automotive Alloys in U.K. and U.S.—a Comparison. *Light Metals,* v. 17, Aug. 1954, p. 253-261.
Designations, properties, composition, and applications of aluminum and magnesium alloys. Tables. (T21, Al, Mg)

271-T. Metallurgy in the Mechanical Spring Industry. V. Nickel Alloys. *Mainspring,* v. 15, Aug. 1954, 4 p.
Compositions, mechanical properties and applications. Diagrams, tables. 3 ref. (T7, Ni)

272-T. Where to Use Aluminum Alloys. W. L. Nelson. *Oil and Gas Journal,* v. 53, Aug. 30, 1954, p. 103.
Services in which aluminum alloys have been or are being used. Table. (T general, Al)

273-T. The Technique of Printing on Aluminum Foil. Kenneth M. Greenwell and E. C. Leonard. *Paper, Film and Foil Converter,* v. 28, Sept. 1954, p. 21-25.
Inks, press techniques, cutting methods. Photographs, diagrams. (T9, Al)

274-T. (French.) **Practical Use of Steel Regenerators in Metallurgical Furnaces.** J. Faure. *Métallurgie et la construction mécanique,* v. 86, no. 4, Apr. 1954, p. 327 + 5 pages.
Characteristics and uses. Comparison with refractory types. Diagrams, photographs. 11 ref. (To be continued.) (T5, ST)

275-T. (German.) **Aluminum in Automobile Construction.** *Aluminium Ranshofen, Mitteilungen,* v. 2, no. 1, June 1954, p. 16-18.
Aluminum alloys for engines, pistons, piston rods, bearings, coolers, bodies and other parts. Photograph. (T21, Al)

276-T. (German.) **Platinum Metals in New Laboratory Equipment.** H. Speidel. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 599-600.
Methods of modifying mechanical and physical properties, mainly by alloying. Applications. Micrographs, graph, photographs. (T8, EG-c)

277-T. (Russian.) **Some Conclusions From an Analysis of the Operation of Three-Fluted Drill Bits.** L. P. Konstantinov and A. S. Mokshin. *Neftianoe Khoziaistvo,* v. 32, no. 7, July 1954, p. 23-27.
Comparison of different steels used in bits. Types of drills adapted to different rock types. Graphs, tables. (T7, ST)

278-T. (Book.) **Elementary Tool Design.** Elmer B. Benson. 224 p. 1954. Chas. A. Bennett, 237 No. Monroe St., Peoria 3, Ill. $4.76.
Selection of materials; interpretation of tooling requirements; design of jigs, fixtures, and dies for cutting, forming, and multiple-operations; and estimation of tool costs. (T6)

V

Materials

General Coverage of Specific Materials

259-V. Columbium Vital in Jet Engine Production. A. F. Cadenhead. *Canadian Metals,* v. 17, July 1954, p. 16, 18.
Occurrence, sources, properties, uses, annual production and price of columbium. Photograph. (T25, Cb)

260-V. Phosphor Bronzes. *Copper & Brass Bulletin,* 1954, Aug., no. 169, p. 8-9.
Compositions, advantages and applications. Table. (Cu)

261-V. Zirconium—How It Is Fabricated. *Light Metal Age,* v. 12, Aug. 1954, p. 16-17, 32, 37.
Forging, rolling, welding, joining, grinding, machining, extruding, drawing, annealing, cleaning and finishing. Photograph. (F general, G general, Zr)

262-V. Borides and Aluminides. New Refractory Hard Metals. John L. Everhart. *Materials & Methods,* v. 40, Aug. 1954, p. 90-92.
Mechanical, physical and corrosion properties of zirconium, chromium and molybdenum borides and nickel aluminide. Photographs, table. (EG-d)

263-V. Ingot Iron and Wrought Iron. *Materials & Methods,* v. 40, Aug. 1954, p. 127.
Tabulated mechanical and physical properties, corrosion resistance, available forms and uses. (Fe)

264-V. Improved Aluminium-Tin Bearing Alloys. J. W. Cuthbertson and E. C. Ellwood. *Metal Industry,* v. 85, July 30, 1954, p. 83-86.
Metallography, forging, heat treatment, bonding and mechanical properties. Graphs, diagram, table, micrographs. 4 ref. (Sn, SG-c)

265-V. Modern Trends in Brasses. Arthur H. Allen. *Metal Progress,* v. 66, Aug. 1954, p. 106-110.
Effects of additions on properties. Characteristics of high-strength bronzes. Photographs, graph, table. (Cu)

266-V. Zirconium. J. H. Keeler. *Product Engineering,* v. 25, Aug. 1954, p. 183-187.
Variables to be considered in study of strength and ductility. Tables, graphs, micrographs, diagrams. 9 ref. (Zr)

267-V. Melting and Fabrication of Zirconium. J. W. Holladay and J. G. Kura. Paper from "Nuclear Engineering. Pt. I.", American Institute of Chemical Engineers, p. 23-30.
Arc-melting techniques. Rolling, extrusion, drawing, machining and joining. Properties and applications. Tables. 31 ref. (Zr)

268-V. Preparation, Properties, and Uses of Beryllium. E. J. Boyle and J. L. Gregg. Paper from "Nuclear Engineering. Pt. I.", American Institute of Chemical Engineers, p. 53-56.
Reduction, melting, crushing, hot pressing and extrusion and mechanical properties. Photographs, tables. 8 ref. (Be)

269-V. Thorium Metallurgy. J. R. Keeler. Paper from "Nuclear Engineering. Pt. I", American Institute of Chemical Engineers, p. 57-61.
Production, working, physical and mechanical properties. Alloy systems. Tables, graphs. 5 ref. (Th)

270-V. Metallurgy of Uranium. H. A. Saller and F. A. Rough. Paper from "Nuclear Engineering. Pt. I.", American Institute of Chemical Engineers, p. 63-67.
Ores, refining, fabrication, alloying. Physical properties. Tables, phase diagrams. 9 ref. (U)

271-V. (Dutch.) **Copper and Copper Alloys. XIV. Special Brass.** W. G. R. De Jager, *Metalen,* v. 9, no. 13, July 15, 1954, p. 208-210.
Effects of tin, manganese, iron, aluminum, nickel, silicon and lead in various combinations with copper and zinc. Tables. 14 ref. (Cu, Zn)

272-V. (French.) **Centenary of Aluminum 1854-1954. Remarks on the French Aluminum Industry.** *Métaux, Corrosion-Industries,* v. 29, no. 346, June 1954, p. 259-267.
History, production, uses and markets. Map, photograph. (Al)

273-V. High Alloy Castings and Their Applications. II. *Industrial Heating,* v. 21, Aug. 1954, p. 1534 + 5 pages.
Oxidation, corrosion resistance at high temperatures and effects of hot wear. Applications. Photographs. (R general, T general, SS, SG-h)

274-V. Production and Hot Working of Titanium. *Industrial Heating,* v. 21, Aug. 1954, p. 1551-1552, 1554.
Reduction, properties and heat treatment. Problems remaining to be solved. (C general, F general, J general, Ti)

275-V. The Platinum-Group Metals. John Cochrane. *Journal of Chemical Education,* v. 31, Aug. 1954, p. 407-409.
Production and metallurgy. Tables. (Pt, Os, Ir, Rh, Pd, Ru)

276-V. Rare Earths. III. Rare Earth Metals—Their Properties and Applications. *Mining Journal,* v. 243, Aug. 6, 1954, p. 158-159.

Nature, mining and treatment; thorium and its compounds; mesothorium and the cerium sub-group; misch metal. 2 ref. (EG-g)

277-V. **Stainless Steels in Brief. I. Roles of the Common Alloys.** Richard E. Paret. *Steel Processing,* v. 40, Aug. 1954, p. 500-504.
Compositions, processing, properties and applications. Photographs. (SS)

278-V. **The Rare Metals.** Clifford A. Hampel. Paper from "Rare Metals Handbook". Reinhold Publishing, Corp., p. 1-15.
Relative abundance, occurrence in ocean and other sources. Processing problems. Tables. 10 ref. (B10, EG-b)

279-V. **The Alkaline Earth Metals Calcium, Barium, and Strontium.** Charles L. Mantell. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 17-29.
Structure, properties, production. Tables, photographs. 32 ref. (Ca, Ba, Sr)

280-V. **Beryllium.** Bengt R. F. Kjellgren. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 31-55.
History, metallurgy, properties, uses. Tables. 24 ref. (Be)

281-V. **Bismuth.** Herbert E. Howe. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 57-69.
Occurrence, production, properties. Tables. 22 ref. (Be)

282-V. **Boron.** Hugh S. Cooper. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 71-86.
Occurrence, production, properties, applications. Micrographs, diagram, photographs. 68 ref. (B)

283-V. **Cadmium.** F. G. McCutcheon and John R. Musgrave. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 87-103.
Production, purification, properties, alloys, fabrication, applications. Table. 75 ref. (Cd)

284-V. **Cobalt.** C. R. Whittemore. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 105-146.
Ores, metallurgy, properties, applications. Powder properties and characteristics. Flow sheet, tables. 291 ref. (H11, Co)

285-V. **Gallium.** A. P. Thompson. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 147-159.
History, production, properties, alloys, applications. Table. 37 ref. (Ga)

286-V. **Germanium.** H. R. Harner. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 161-172.
Extraction, properties, alloys, applications. Table. 63 ref. (Ge)

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History, production, properties, applications. Tables, photographs. 84 ref. (Hf)

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Occurrence, statistics, recovery, properties. Diagram, tables, flow sheet, photograph, graph. 71 ref. (In)

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History, production, properties, applications. Alloys. Diagrams, tables. 144 ref. (Li)

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Production, properties, applications. Diagrams, tables. 29 ref. (Mn)

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Occurrence, metallurgy, properties, working. Photographs, tables. 15 ref. (Mo)

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Production, economic statistics, properties, working, applications. Tables, graphs. 91 ref. (EG-c)

293-V. **Rare Earth Metals.** Howard E. Kremers. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 329-346.
Extraction, properties, fabrication techniques, applications. Tables. 68 ref. (EG-g)

294-V. **Rhenium.** A. D. Melaven. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 347-364.
Metallurgy, properties, applications. Table, diagrams. 82 ref. (Re)

295-V. **Selenium.** John R. Stone and Peter E. Caron. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 365-377.
Production, properties, applications. Tables, graph. 10 ref. (Se)

296-V. **Silicon.** Donald W. Lyon. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 379-388.
Occurrence, properties, applications. Tables. 98 ref. (Si)

297-V. **Tantalum and Columbium.** Leonard F. Yntema and Allan L. Percy. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 389-404.
Extraction, properties, metallography, fabrication and applications. Photographs, tables. 9 ref. (Cb, Ta)

298-V. **Tellurium.** John R. Stone and Peter E. Caron. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 405-415.
Metallurgy, properties, toxicity, applications. Tables. 11 ref. (Te)

299-V. **Thallium.** Herbert E. Howe. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 417-428.
History, production, properties, applications. Tables. 74 ref. (Tl)

300-V. **Thorium.** William C. Lilliendahl. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 429-454.
Ore purification, metallurgy, properties, melting, applications. Tables, diagrams, photographs. 84 ref. (Th)

301-V. **Titanium.** H. R. Ogden and Bruce W. Gonser. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 455-482.
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Ores, metallurgy, working, properties, fabrication, applications. Photographs, tables. 9 ref. (W)

303-V. **Uranium.** George Meister. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 501-571.
History, properties, metallurgy, structure, reactions, alloys. Tables, diagrams, graphs, flow sheets, micrographs. 389 ref. (U)

304-V. **Vanadium.** H. E. Dunn, D. L. Edlund, and T. G. Griffin. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 573-602.
Occurrence, properties, metallurgy, application. Tables, diagrams. 42 ref. (V)

305-V. **Zirconium.** A. W. Schlechten. Paper from "Rare Metals Handbook". Reinhold Publishing Corp., p. 603-622.
History, sources, metallurgy, properties, applications. Tables. 84 ref. (Zr)

306-V. (French.) **Aluminum and Its Alloys.** Raymond Chevigny. *Revue de l'Aluminium,* v. 31, no. 211, June 1954, p. 175-179.
Heat treatment, mechanical properties and transformations of copper, silicon, magnesium and zinc alloys. (Al, Cu, Zn, Mg)

307-V. (French.) **Working of Aluminum.** *Revue de l'Aluminium,* v. 31, no. 211, June 1954, p. 192-200.
Casting methods, drawing, pressing, forging, welding, anodic oxidation, electrolytic and chemical polishing and painting. Photographs. (Al)

308-V. **Alcan 135.** (Aluminum Casting Alloy). *Alloy Digest,* no. Al-20, Sept. 1954.
Composition, physical characteristics, mechanical properties, heat treatment, machinability and weldability. (Al)

309-V. **Meehanite GC.** (High Strength, Close Grain Iron Casting). *Alloy Digest,* no. CI-8, Sept. 1954.
Physical constants, mechanical properties, heat treatment and machinability. (CI)

310-V. **Elektron RZ5.** (Heavy-Duty Magnesium Casting Alloy). *Alloy Digest,* no. Mg-12, Sept. 1954.
Composition, physical constants, mechanical properties, castability, heat treatment, machinability, joining, surface treatment and corrosion resistance. (Mg)

311-V. **NA22H.** (Heat Resistance Alloy). *Alloy Digest,* no. Ni-11, Sept. 1954.
Composition, physical constants, mechanical properties, heat treatment, machinability, weldability, corrosion resistance and pickling. (SG-h, Ni, Cr, W)

312-V. **Federated No. 7.** (Bearing Alloy). *Alloy Digest,* no. Pb-1, Sept. 1954.
Composition, physical constants, mechanical properties, chemical bonding and general characteristics. (SG-c, Pb, Sn, Sb)

313-V. **Standard Alloy HR-6.** (Heat & Corrosion Resistant Casting Alloy). *Alloy Digest,* no. SS-18, Sept. 1954.
Composition, physical characteristics, mechanical properties, heat treatment, weldability, machinability and corrosion resistance. (SG-h, SS)

314-V. **Airque.** (Cold Die Steel). *Alloy Digest,* no. TS-24, Sept. 1954.
Composition, properties, heat treatment, workability and machinability. (TS)

315-V. **Selenium.** J. D. Sargent. *U. S. Bureau of Mines, Information Circular* 7690, July 1954, 25 p.

Properties, geology, mineralogy, production and consumption, metallurgy, and uses. Tables, diagram, maps, graph. 187 ref. (Se)

316-V. Investigation of Nickel-Aluminum Alloys Containing From 14 to 34 Per Cent Aluminum. W. A. Maxwell and E. M. Grala. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3259, Aug. 1954, 42 p.

Casting, properties, microstructures. Tables, micrographs, graphs, photographs. 13 ref. (Al, Ni)

317-V. (German.) **The Active Substance Beryllium.** Wilhelm von Haken. *Chemische Industrie,* v. 6, no. 8, Aug. 1954, p. 445-447.

Production, application, resources. Tables. (Be)

318-V. (German.) **The Importance of Precious Metals in Modern Materials Development.** K. Ruthardt. *Metall,* v. 8, nos. 15-16, Aug. 1954, p. 591-596.

Mechanical, physical and chemical properties, applications. Photographs, tables. (T general, EG-c)

319-V. (Italian.) **Production and Application of Hyperpure Lead.** L. Fagnani. *Metallurgia italiana,* v. 46, no. 6, June 1954, p. 211-220.

Chemical and mechanical characteristics and influence of various impurities. Tables, photographs. 10 ref. (Pb)

320-V. (Book.) **Stainless Iron and Steel.** H. J. G. Monypenny. v. II. Chapman & Hall, Ltd., London, England. 55s.

Microstructure; constitution. Properties. Intergranular corrosion. Embrittlement. (SS)

321-V. (Book.) **The Structure and Properties of Mild Steel.** C. A. Edwards. 154 p. 1953. American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio. $4.00

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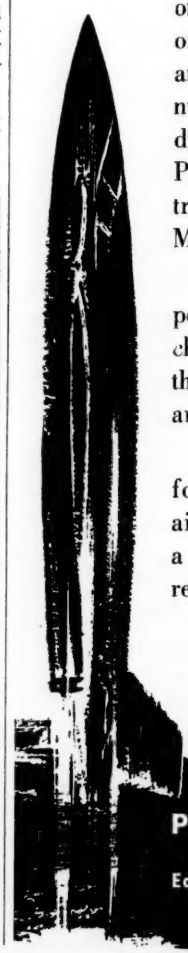

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CHIEF EXECUTIVE: Leading British furnace and thermal engineering firm and their U. S. associates invite application for position as chief executive for their French company located in Paris. Excellent scope and opportunity for thoroughly versatile engineer of requisite technical knowledge coupled with administrative and sales experience. Fluent French and English essential. Give full particulars of technical education and record of executive posts held and responsibility in each instance. Replies treated in strict confidence. Box 10-35.

POSITIONS WANTED

WELDING ENGINEER: B.S. in metallurgical engineering, has diversified welding background. Age 24, married, two children. Experienced in both resistance and arc welding of titanium, magnesium, aluminum, steels and stainless steels, Cleveland. Box 10-45.

METALLURGIST-ATTORNEY: Age 35, fourteen years experience includes chief metallurgist, steel mill, research metallurgist, industrial research organization, contractual and technical regional representative department of defense argency supporting research. B.S. degree in chemistry and LLB. Member of bar and registered professional engineer. Record shows continuous progress. Executive position utilizing resources desired. Box 10-50.

METALLURGIST: Age 40, B.S. degree experienced in ferrous and nonferrous metals including foundry work, process control, selection of materials, specifications. Will accept position in laboratory, production or technical sales. Detroit area. Box 10-55.

METALLURGIST: B.S. in mineral economics. Certificate in physical metallurgy. Age 28, single. Three years experience in ferrous and nonferrous metallurgy in aircraft industry. Desires work in steel mill, foundry or heat treating company where there are possibilities for broadening experience and advancement. Box 10-60.

METALLURGICAL ENGINEER: Age 34, family. Eight years diversified experience as plant metallurgist in manufacture of precision special and high-production ferrous and nonferrous products and tooling. Registered professional engineer, personable, progressive, cooperative and cost conscious. Excellent education. Experienced in rolling, forming, casting, joining, machining, heat treating, standardization, trouble shooting and metallurgical development and design. Desires peace-time staff position. Box 10-65.

MECHANICAL METALLURGIST: Age 34, M.S. degree in mechanical engineering, ScD. degree in metallurgy. Seven years college teaching in both fields, two years in design, three years in industrial research on light metals. Author technical papers. Registered metallurgist. Desires research and development position. Box 10-70.

METALLURGICAL ENGINEER: B.S. degree, age 32, family. Nine years diversified experience in heat treating, material specifications, metal finishing. Desires responsible position with progressive West Coast firm or branch office. Will consider technical sales and service work. Box 10-75.

METALLURGIST-CHEMIST: Graduate in chemistry, M.A in analytical chemistry, registered professional engineer in metallurgy, age 40. Experienced in tungsten carbide manufacture, design, brazing, heat treatment of steel, chemical analysis, carbide rock bits, drill steel, plastics. Desires position in research, production or junior executive level with scope for advancement. Box 10-80.

PHYSICAL METALLURGIST: Ph.D. degree, age 34, married, children. Eight years experience in weldability research, five years teaching physical metallurgy, diversified industrial experience in metallographic work, heat treating and general physical metallurgy. Desires research or research and development position. Will consider production work in which technical ability is of paramount importance. Box 10-85.

METALLURGICAL ENGINEER: Age 33, married, children. Presently employed as process engineer in charge of all die casting and finishing operations. Six years diversified experience in management, engineering,

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METALLOGRAPHERS	B.S. plus 2 or more years experience in non-ferrous metallography
METALLURGISTS SOLID .STATE PHYSICISTS PHYSICAL CHEMISTS	B.S. — M.S. — Ph.D. Fundamental and applied work in corrosion, physical metallurgy, high-temperature problems
METALLURGICAL or WELDING ENGINEERS	B.S. — M.S. Applied work in weldability studies, welding methods, etc.

Send resume' and salary requirements to
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Technical Personnel

CARBIDE and CARBON CHEMICALS COMPANY
A Division of Union Carbide and Carbon Corporation
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Oak Ridge, Tennessee

MANUFACTURERS AGENTS

Wanted by well-known manufacturer of specialized industrial furnaces (oil-gas-electric). Excellent opportunity in each of these areas—New England States, Cleveland, Pittsburgh.

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production, inspection, purchasing and government material controls. Seeks industrial management position with progressive die cast, foundry, permanant mold or investment casting company. Any location. Box 10-90.

TECHNICAL SALES or PROCESS METALLURGIST: Ten years technical sales nonferrous mill products in east. Ten years processing and research on brass mill products. Desires to locate where experience and contacts can be utilized, such as sales or production of mill products. Resume upon request. Box 10-95.

METALLURGICAL ENGINEER: B.S. degree, 10 years experience. Process development and research in rolling, welding and sizing of steel, aluminum and stainless steel tubing. Has designed, built and successfully operated gas generators, heat treat furnaces and tube mills. Supervisory, production and laboratory experience. Age 34, married, children. Desires responsibility. Box 10-100.

SUPERVISOR: Has 25 years experience in production metallurgy of melting of steel, stainless, heat resisting alloys, nodular irons, etc., in electric arc and induction furnaces. Production control of chemical elements for specification metals. Broad knowledge of foundry casting problems. Box 10-105.

METALLURGIST-SALES ENGINEER: With 17 years experience in all phases of manufacture and fabrication of corrosion and heat resistant alloys. Outstanding record of achievement. Proven administrator, consultant and technical writer. Presently employed as chief metallurgist of electric furnace steel plant. Desires to relocate. Interested in challenging and responsible position. Box 10-115.

DEVELOPMENT ENGINEER

To develop techniques for nondestructive inspection of reactor components. An unusual opportunity to set up laboratory and direct experimental programs. Two years of applicable experience required. Laboratories located in suburban Pittsburgh near excellent housing of all types. Your application will be handled promptly and confidentially. Please write in detail, giving complete information concerning training, experience and salary requirements to C. F. Stewart, Supervisor of Industrial Relations, WESTINGHOUSE ATOMIC POWER DIVISION, P.O. Box 1468, Pittsburgh 30, Pa.

RESEARCH METALLURGIST

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of Illinois Institute of Technology

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METALLURGIST-CHEMIST: Strong mathematics background. Age 27, married, two children. Background of four years metallurgical work including research on reduction of titanium, mechanical testing and development of ferrous alloys and chemical analytical work. Desires position in metallurgical production, will consider basic production mining and ore dressing. Box 10-120.

METALLURGIST: Chemist with proven ability in setting up and administering technical program, particularly in brass and steel fields. Patents, publications. Resume upon request, describes broad background of administrative, research and production experience in metals industry. Desires supervisory position with heavy responsibility. Box 10-125.

METALLURGICAL ENGINEER: M.S. in metallurgy, age 28, married, one child, veteran. Has 4½ years experience in engineering, production, development, research of titanium metal, including Kroll reduction, distillation, leaching, electrolytic, melting, casting, alloying and machining. One year as instructor physical metallurgy and mechanical testing. Academic background in physical, mechanical metallurgy, and physical chemistry. Box 10-130.

CHIEF ENGINEER: Registered M.E. and Ch.E. with last 15 years as chief engineer and chief metallurgist of four fabricating and processing plants, desires new permanent position Los Angeles area. Age 42. Design and production experience and development in ferrous, nonferrous metals and their processing. Box 10-135.

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METALLURGISTS

Alloy Development — Includes composition development for high-temperature and magnetic alloys, phase diagrams, creep, precipitation hardening, vacuum melting and other techniques. Development experience in physical metallurgy or alloy systems, background in theoretical physical metallurgy and knowledge of solid state physics useful. M.S. or Ph.D. in metallurgical engineering. For application write: Westinghouse Electric Corp., Educational Dept., East Pittsburgh, Pa.

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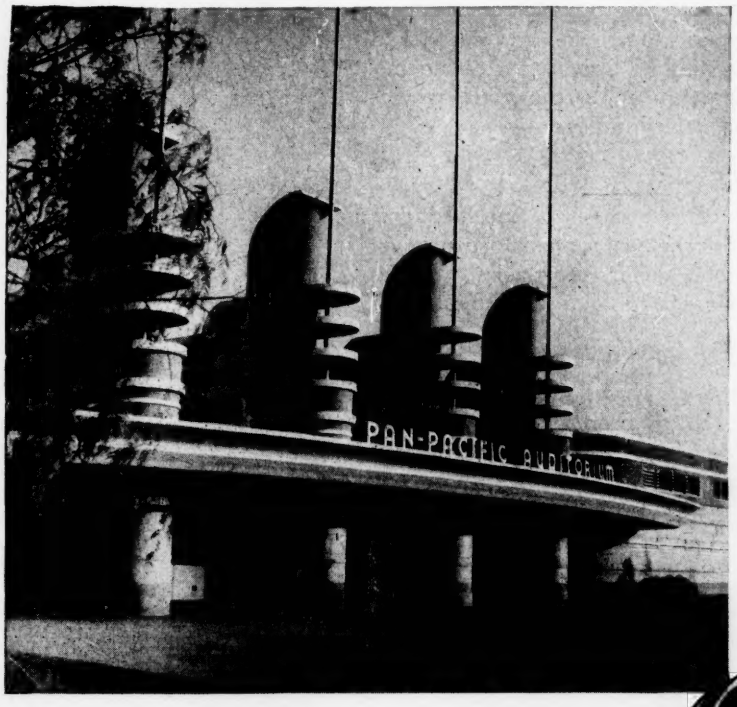

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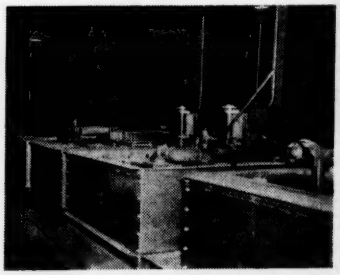
PATENTS: (Insurance)

Patents we have or have pending are considered the same as we consider insurance. You pay no *extra dollars* to buy Holden products because of patents held by us or because these products are made under these patents. It does provide us with the opportunity of making our products to specifications which provide an extra profit to you because of the general chemical or mechanical values.



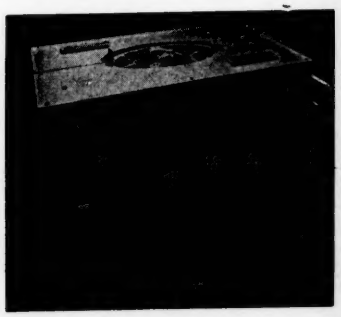
1500-lbs Per Hr. *Isothermal Heat Treating* *425 KVA*

SPECIFICATIONS: (Quality)

All Holden products are made to definite chemical specifications. These chemical specifications are specific whether applied to a product which we make under a Holden patent or whether you require a particular chemical analysis which you feel is more suitable to your application.

PRICING: (Competitive)

The prices you pay for Holden products versus specification products differ only as follows: If the specification product does not utilize any expensive chemicals, then our price is directly competitive to any firm quoting nationally on an identical product.



Gas Fired Type 212, Temperature range 300-1700°F.
U. S. Patent

PRICE DIFFERENCE: (Profits)

Our price difference between Holden specifications under Holden patents differs in the more expensive chemicals which may be required for the same temperature range. The price, therefore, is based on the cost of a given specification plus the variance in difference in cost where Holden additives may be used.

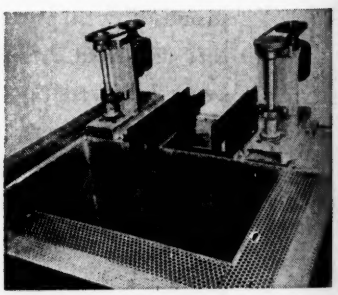
ADDITIVES:

The value of additives in Holden products cannot be too highly stressed versus rectification. Holden additives are covered by U.S. patents issued or pending. These additives do the following for you, in relation to profits:

1. Increase your ceramic pot life 50% or more.
2. Increase your electrode life from 5 weeks to 5 months in over-the-side electrode furnaces using inconel electrodes.
3. Increase your alloy pot life from 500 to 3000 hours depending on chemical analysis.

PROFITS: (Extra)

The profits to be made by use of Holden products and equipment relate to LESS DOWN TIME, LONGER LIFE OF ELECTRODES, CERAMIC POTS and many other factors which contribute to the basic burden of a business.



Type 401 Marquenching Austempering Furnace. 300 to 10,000 lbs. production

VAPORIZATION:

Dollar for dollar you will find that Holden salt baths have less vaporization because of the stabilizers and additives present in the salt baths and therefore instead of 10 to 20% of your salt losses going up the stack, they are available for productive use in all Holden products.

As a matter of information, you may be interested in some of the Holden FIRST:

1. The first single liquid carburizing salt bath in the United States.
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3. The first stable bath for nitriding high speed steels.
4. A method of bright tempering steel articles in salt baths.
5. A method for wire patenting in salt baths and simultaneously coating with a drawing lubricant.
6. A pressure nitriding process which can be used on nitralloy as well as stainless steels.
7. An open end sighting tube for controlling salt baths at high temperatures.
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